

IM-515

User's Manual

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Intelligent POS Terminal

IM-515

User's Manual

400876501

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This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

WARNING

The connection of a non-shielded interface cable to this product will invalidate the FCC Verification of this device and may cause interference levels which exceed the limits established by the FCC for this equipment.

You are cautioned that changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

FOR CANADIAN USERS

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

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DECLARATION of CONFORMITY for CE MARKING

Product Name POS COMPUTER

Type Name M132B

Conforms to the following Directive(s) and Norm(s)

Directive 89/336/EEC

EN 55022 (1986/1994 2nd) class B

EN 50082-1 (1992)

IEC 801-2 level 2

IEC 801-3 level 2

IEC 801-4 level 2

Product Name AC Adapter

Type Name M131A

Conforms to the following Directive(s) and Norm(s)

Directive 89/336/EEC

EN 55022 (1986/1994 2nd) class B

EN 50082-1 (1992)

EN 61000-3-2 (1995)

EN 61000-3-3 (1995)

EN 50082-1 (1992)

IEC 801-2 level 2

IEC 801-3 level 2

IEC 801-4 level 2

Directive 73/23/EEC

Safety: EN 60950 Rev. 3

Contents

Safety Precautions	i
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Introduction

Options	2
Unpacking	3
Power On and Off	4
Part Names and Functions	5
Handling Guidelines	11
Usage and Storage Environment	13
About This Manual	14

Chapter 1 Set Up Guidelines

General Setup Procedure	1-1
Precautions	1-2
Step 1 - Installing Internal Components	1-2
Step 2 - Jumper/DIP Switch Settings	1-3
Step 3 - Connecting the TM Printer	1-4
Step 4 - Connecting Your Peripherals	1-6
Step 5 - Connecting the Power Supply	1-7
Step 6 - Attaching the Back Cover	1-8
Step 7 - Setting the BIOS Setup Utility	1-9
Step 8 - Setting the Drawer Password	1-10
Step 9 - Installing your OS or Application software	1-10
Step 10 - Charging the Batteries	1-10

Chapter 2 Component Installation

Removing the Transportation Screw	2-1
Removing the IM Module from the Cover	2-2
Installing a CPU	2-3
Installing or Removing a SIMM	2-6
Installing a Hard Disk Drive	2-8
Installing a Floppy Disk Drive	2-11
Installing a PCI/ISA Card	2-14
Installing a PCMCIA Expansion Module (PC Card Slot)	2-16
Setting Jumpers/DIP Switches	2-19
Main Board Jumper/DIP Switch Settings	2-20
Interconnection board jumper settings	2-28

Chapter 3 Using the System Utilities

Using BIOS Setup	3-1
Starting BIOS Setup	3-1
Setup Keys	3-2
Getting Help	3-3
In Case of Problems	3-3
Main Menu	3-3
Standard CMOS Setup	3-5
BIOS Features Setup	3-7
Power Management	3-10
Integrated Peripherals	3-14
Supervisor/User Password Setting	3-16
Using Device Diagnostics	3-17
Device Diagnostics Utility Conditions	3-18
Starting Device Diagnostics	3-18
Device Diagnostics Screen	3-20
Using the Setup Menu	3-25
Running Device Tests	3-27
Initializing Device Diagnostics	3-30
Leaving Device Diagnostics	3-30

Appendix A Error Messages

Appendix B Power Management

Appendix C Loop Back Connectors

Appendix D Specifications

Appendix E EPSON Sales Subsidiaries

Safety Precautions

This section presents important safety information. Read this section carefully.

Warnings, Cautions, and Notes

Notes and precautions in this manual are identified by their level of importance, as defined below.

⚠ *WARNING*

Warnings must be followed carefully to avoid serious bodily injury.

⚠ *Caution*

Cautions must be observed to avoid minor injury to yourself, damage to your equipment, or loss of data.



Note:

Notes have important information and useful tips on the operation of your equipment.

Safety Precautions

WARNING

Unplug the power cord from the power outlet immediately if the product produces smoke, a strange odor, or unusual noise. The IM-515 power switch may not work in such a case, since it is controlled by software. Also, place the power supply where you can unplug the power cord in such an event. Continued use may lead to fire or electric shock. After unplugging the power cord, contact your dealer or an EPSON® service center for advice. Never attempt to repair the product yourself. Improper repair work can be dangerous.

Never disassemble or modify the product. Tampering with this product may result in injury, fire, or electric shock.

Be sure to use the enclosed power supply. Connection to an improper power supply may cause fire or shock.

Never insert or disconnect the power plug with wet hands. Doing so may result in severe shock.

Do not allow foreign matter to fall into the product. Penetration of foreign objects may lead to fire or shock.

If water or other liquid spills into the product, unplug the power cord immediately, and then contact your dealer or an EPSON service center for advice. Continued use may lead to fire or shock.

Do not place multiple loads on the power outlet (wall outlet). Overloading the outlet may lead to fire. Always supply power directly from a standard domestic power outlet.

⚠WARNING (continued)

Handle the power cord with care. Improper handling may lead to fire or shock. Also note the following:

Do not modify or attempt to repair the cord.

Do not place any object on top of the cord.

Avoid excessive bending, twisting, and pulling.

Do not place cord near heating equipment.

Check that the plug is clean before plugging it in.

Be sure to push the prongs all the way in.

If the cord becomes damaged, obtain a replacement from your dealer or an EPSON service center.

Be sure your power cord meets the relevant safety standards and includes a power-system ground terminal (PE terminal).

Do not connect the power supply to any equipment, except the IM-515, EPSON TM-H5000/H5000II series printer, and EPSON TM-U950 series printer. Improper usage may lead to equipment damage, fire, or shock.

⚠ Caution

Cables for internal devices and peripheral devices must be connected properly according to this manual. Improper connection may lead to equipment damage, fire, or shock.

Be sure to set this equipment on a firm, stable, horizontal surface. The product may break or cause injury if it falls.

Do not use in locations subject to high humidity or dust levels. Excessive humidity and dust may cause equipment damage, fire, or shock.

Do not place heavy objects on top of the product. Never stand or lean on the product. Equipment may fall or collapse, causing breakage and possible injury.

Do not drop, bump, or otherwise subject to strong vibration or impact.

Do not block the openings on the product. They are provided for the ventilation necessary to ensure reliable operation and protection from overheating.

Never clean the product with thinner, benzene, alcohol, or other such solvent.

To ensure safety, please unplug this product prior to leaving it unused for an extended period.

Introduction

The IM-515 is an intelligent terminal for the point of sale (POS) environment. The IM-515 offers the following features:

- IBM® PC/AT® compatible.
- Intel Pentium®, MMX Pentium, or AMD-K6® processor is available.
- 512KB cache (pipelined burst) memory is supported.
- Plug & Play BIOS function is supported.
- Power Management based on APM (Advanced Power Management) Ver. 1.2.
- Detection and alarm functions for power voltage, temperature, and fan rotation are supported.
- Four serial interfaces with FIFO and one parallel interface.
- 5 V or 12 V can be supplied to each serial port.
- One 2.5-inch hard disk drive (HDD) and one 3.5-inch floppy disk drive (FDD) can be installed internally.
- Three PCI expansion slots.
- One ISA expansion slot.
- Two USB ports.
- Two exclusive expansion slots.
- 32KB NVRAM for POS.
- Flash ROM that can update the BIOS for the system ROM.

- Uniform design with EPSON® TM series printers.
- No tools required for docking with the TM series.
- Small footprint.
- A maximum of four optional PCMCIA card slots can be installed.
- Built-in device diagnostics utility.

Options

The base model provided for the IM-515 lets you build an optimized system by selecting the options described below:

- CPU
- SIMM
- 3.5-inch floppy disk drive
- 2.5-inch hard disk drive
- PCMCIA expansion module

Please contact your dealer for more detailed information.



Note:

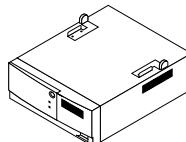
*A video board and an interface cable are not provided as an option.
Please obtain an appropriate video board and interface cable.*

Unpacking

When you unpack the IM-515, make sure you have these items:

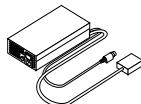
Main unit

- IM-515



Accessories

- Power supply (*)



- CPU cooling fan



- Back cover



- Keys (2 pieces)



- FDD ribbon cable



- FDD power cable



- Screws for an FDD (2 pieces)



- Screws for an HDD (4 pieces)



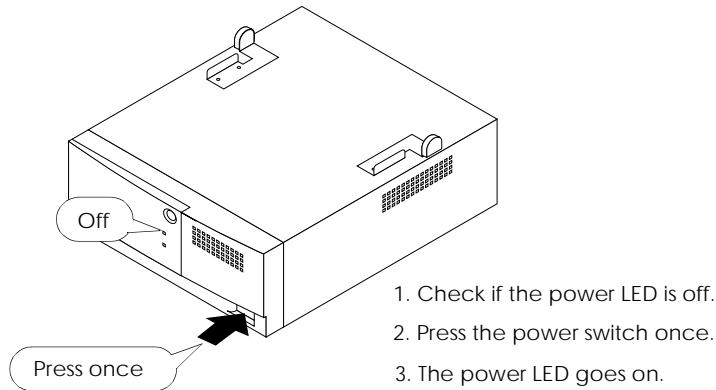
(*) Note that the package does not include a power cord for the power supply. Please obtain an appropriate power cord before using the IM-515.

If any of these items is damaged or missing, please contact your dealer for assistance.

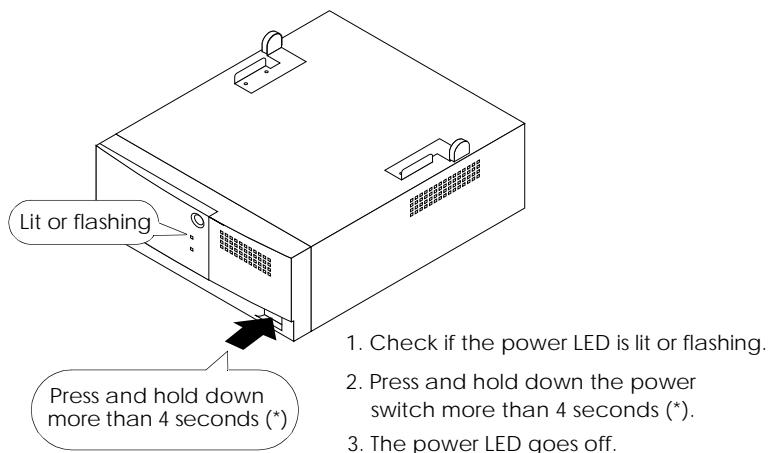
After unpacking, save the packing materials so that you can reuse them for future transport.

Power On and Off

Power on



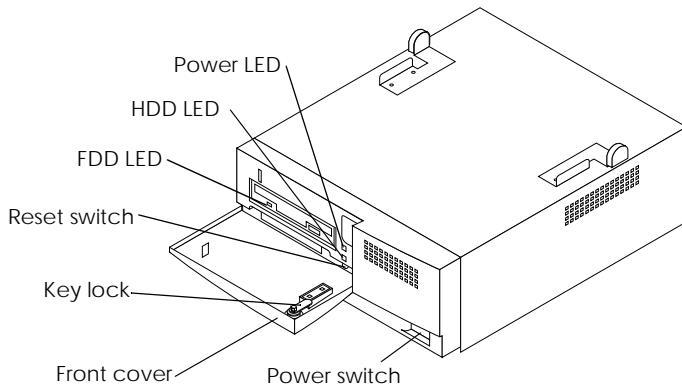
Power off



(*) Depending on the power management settings in BIOS setup, the IM-515 may remain on if the button has been pressed less than 4 seconds.

Part Names and Functions

The following illustration is a front view of the IM-515.



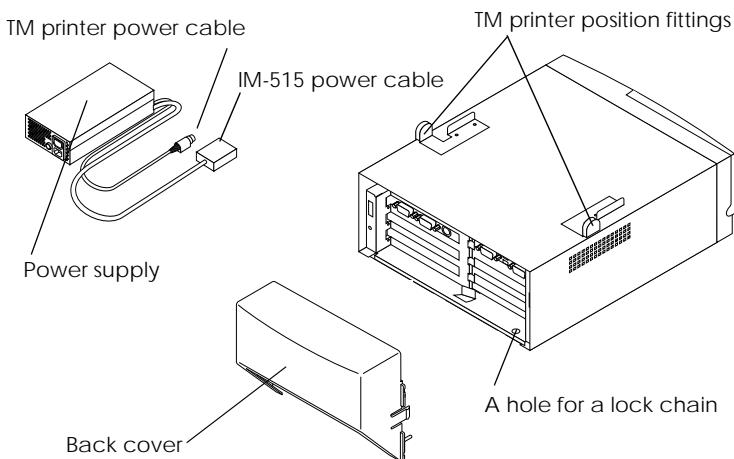
Part names and functions (front view)

Part name	Function
Power LED (Green)	The Power LED indicates power on/off and the power management mode. Lit: Power is on (working mode or doze mode) Flashing in 2 Hz: standby mode Flashing in 1 Hz: suspend mode Off: Power is off (soft off mode) (See Appendix B for information about power management.)
Power switch	Push-type switch to power the IM-515 on or off. This switch also functions to change the power management mode. Power on: Push once when IM-515 is off. Power off: Push and hold down more than 4 seconds (*) when power is on. (*) Depending on the setting of the BIOS setup, the IM-515 may not be turned off if it is pressed less than 4 seconds. See Appendix B for information about power management.
Reset switch	Push-type switch to reset the IM-515; accessible using a pointed object like a ball-point pen.

Part names and functions (front view)

Part name	Function
Front cover and key lock	The key lock secures the front panel, making the floppy disk drive inaccessible and securing the cover set.
HDD LED (Green)	The HDD LED indicates accessing of the hard disk drive (when a hard drive is installed).
FDD LED	The FDD LED indicates accessing of the floppy disk drive (when a floppy disk drive is installed). The FDD LED is attached to the floppy disk drive.

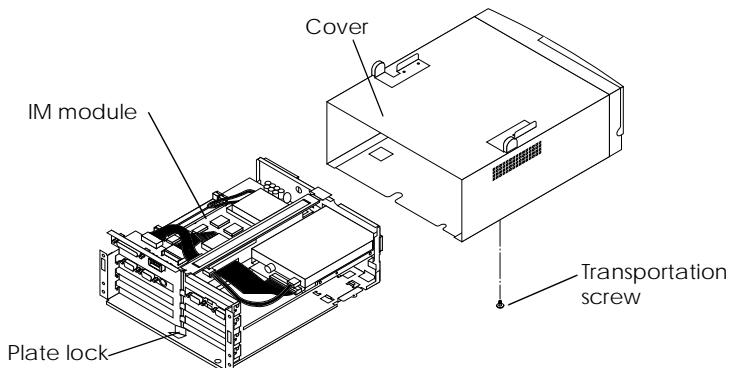
The following illustration is a rear view of the IM-515.



Part names and functions (rear view)

Part name	Function
TM printer position fittings	These are guides for the TM printer to position it in the correct location. You can remove the fittings when they are not necessary by removing the securing screw. These fittings are only for positioning and not for mounting the TM printer. Be careful not to let the TM printer drop when moving the unit.
Back cover	The back cover hides cables connected to the rear panel. When attached to the IM-515, it can also cover cables to the TM printer.
Power supply	This is an exclusive power supply designed for the IM-515. Note that this power supply does not have an on/off switch. Place the power supply where you can easily unplug the power cord in case of a problem.
TM printer power cable (DC)	This is the power cable for the TM printer.
IM-515 power cable (DC)	This is the power cable for the IM-515.
Hole for a lock chain	The chassis has a hole for a lock chain

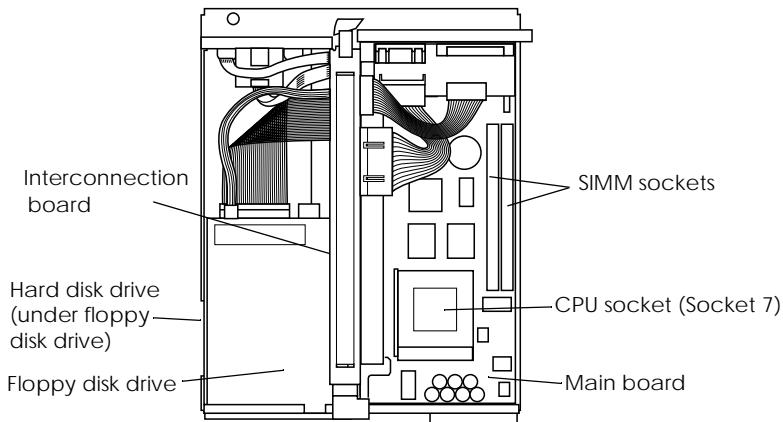
The illustration below is the view when the IM module is removed from the cover.



Part names and functions (when the IM module is removed)

Part	Function
IM module	The IM module is a control unit without the cover. Before you can install internal components or change DIP switch or jumper settings, you need to remove the cover from the IM module.
Plate lock and cover	The plate lock prevents the inside of the unit from falling when it is moved because of the unit's sliding structure. This hook can be opened or closed easily, and it also is used as a knob to remove an internal module. The hook is locked automatically when the internal module is inserted.
Transportation screw	The IM module is secured to the cover during shipping by a transportation screw.

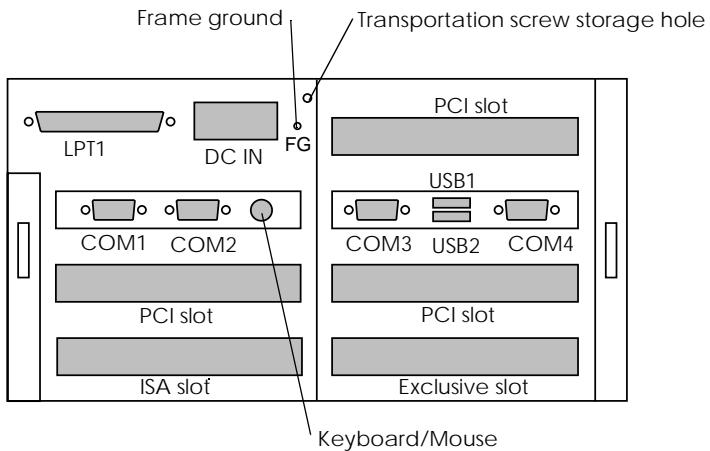
The following illustration shows the major components in the IM module.



Part name and functions (major components)

Part name	Function
Main board	Main board of the IM-515.
CPU socket (Socket 7)	CPU socket. See Appendix D for the supported CPUs. The CPU cooling fan should be attached after installing a CPU.
SIMM sockets	Two SIMM sockets are provided. See Appendix D for details on the SIMMs.
Hard disk drive	One mount is available for a 2.5-inch hard disk drive (19 mm or 0.75" maximum) with an IDE/EIDE controller conforming to MCC standards.
Floppy disk drive	One mount is available for a 3.5-inch floppy disk drive with 720KB/1.44MB storage capacity.
Interconnection board	The interconnection board contains the jumpers to set COM port functions.

The illustration below is the rear panel of the IM-515.



Part name and functions (rear panel)

Part name	Function
COM1 to 4, LPT1, USB1 and 2 keyboard/mouse connectors	Interface connectors. Each interface connector has an icon based on the PC97 standard by Microsoft Corporation. See Appendix D for details on the interfaces.
DC IN connector	DC power IN connector. The power supply DC cable is connected here.
PCI, ISA, and exclusive expansion slots	Expansion slots. See Appendix D for details.
Frame ground screw	If your interface cable needs a frame ground, use this screw.
Transportation screw storage hole	The IM module is secured by the transportation screw on the bottom of the unit to prevent damage by vibration. The removed screw can be attached in this hole to prevent it from becoming lost.

Handling Guidelines

Observe these guidelines for proper usage:

- Make sure you read the safety precautions in this manual before you use the IM-515.
- Make sure the total power requirements of all devices receiving power from the IM-515 does not exceed the IM-515 power limitations. See Appendix D for details.
- When you transport the IM-515 in its shipping container, make sure you replace the transportation screw.
- Do not block any slots or openings on the IM-515. These are provided for the ventilation necessary to ensure reliable operation and protection from overheating.
- TM printer position fittings are only for positioning and not for mounting the TM printer. Be careful not to let the TM printer drop when moving the unit.
- Never hold the IM-515 by the back cover. This cover cannot support the weight of the unit, so it may fall onto the floor.
- Except when installing the PC card, always use the PC card cover (*) to protect it from static electricity.

(*) If you have the optional OI-B05, close the front cover of the IM-515. If you have the optional OI-B06, attach the PCMCIA slot cover enclosed with the OI-B06 package. See page 2-17 for details on the PCMCIA slot cover.

- When you move the IM-515, make sure the IM module is secured by the plate lock. The module could fall from the cover if it isn't secured.
- Make sure any device connected to the AC outlet of the power supply does not consume more than 200 VA.

- Do not connect to electrical outlets that are close to devices that generate voltage fluctuations or electrical noise. In particular, stay clear of devices that use large electric motors.
- Do not place the side of the power supply connecting the power cord or DC cables down.
- Always connect the DC cables before plugging the power cord into the wall outlet.
- Be sure to push the end of the power cord all the way into the AC inlet. The fitting on the cord should make contact with the back of the inlet.
- When disconnecting power, always unplug the power cord from the wall outlet before disconnecting the DC cables.
- When disconnecting a DC cable, hold it firmly at the connector area. Do not tug on the cord itself.
- To clean the unit, wipe with a dry or slightly moistened (and firmly wrung) cloth. Never clean the unit while it is plugged into the wall outlet.
- Never attempt to stretch the cords to make a connection. The power cord and DC cables must have adequate slack at all times during use.
- Never allow the power supply to hang from the power cord or DC cables.

Usage and Storage Environment

Keep away from the following:

- Direct sunlight
- High temperature and humidity
- Extreme changes in temperature or humidity
- Heating and cooling equipment
- Volatile materials
- High levels of dust
- Locations where it might become wet
- Fire
- Vibration and impact.

About This Manual

- ❑ **Chapter 1** contains guidelines on setting up the IM-515.
- ❑ **Chapter 2** contains information on setting the DIP switches and jumpers, and installing component devices into the IM-515.
- ❑ **Chapter 3** contains information on using system utilities.
- ❑ **Appendix A to Appendix E** contain error messages, power management functions, loop back connector information, specifications, and list of the EPSON sales subsidiaries and their addresses.

Chapter 1

Set Up Guidelines

The IM-515 is designed so it can use various combinations of components or peripherals. Therefore, the setup procedure depends on your system configuration. This chapter explains the essential information for setting up your IM-515 system.

General Setup Procedure

The following table shows you the general procedure for setting up the IM-515. Follow this procedure for whatever you install. Detailed descriptions for each items follow this section.

General Setup Procedure

Step #	Set up items
Step 1	Install internal components
Step 2	Set jumpers and DIP switches
Step 3	Connect the TM printer
Step 4	Connect your peripherals
Step 5	Connect the power supply
Step 6	Attach the back cover
Step 7	Set the system configuration using BIOS setup
Step 8	Set the supervisor password
Step 9	Install your OS (operating system) or application software
Step 10	Charge the battery

Precautions

If you open the cover of the IM-515, observe these precautions:

Caution

Components on the internal boards in the IM-515 can get hot. Turn off the IM-515, and wait at least 10 minutes for components to cool before you remove the cover.

To prevent damage, make sure you turn off the IM-515 and disconnect the power supply. You must disconnect the power supply because the electrical current is flowing in some parts of the circuit even when the power is turned off.

To prevent damage, make sure you disconnect any peripheral devices.

To avoid generating static electricity and damaging the components, ground yourself by touching a grounded metal surface before you touch any component.

To avoid contamination, do not touch the connectors on the components.

Step 1 - Installing Internal Components

If you want to install internal components in the IM-515, you need to remove the transportation screw and the cover first. Check the table below to see where these procedures are described; then follow the instructions on that page.

Work	See page
Removing the transportation screw	2-1
Removing the IM module from the cover	2-2

Once you remove the cover from the IM module, turn to the appropriate sections in Chapter 2 and follow the instructions for installing the component.

Work	See page
Installing a CPU and a CPU cooling fan	2-3
Installing a SIMM	2-6
Installing a hard disk drive	2-8
Installing a floppy disk drive	2-11
Installing a PCI/ISA card	2-14
Installing a PCMCIA expansion module	2-16

When you have the components installed, go to next section.

Step 2 - Jumper/DIP Switch Settings

If you installed a CPU, you need to set the jumpers and DIP switches. If you want to provide +5 V or +12 V power to COM1 to COM4, you also need to set the jumpers.

Check the table below to see where these procedures are described; then follow the instructions on that page.

Work	You need to	See page
If you have installed a CPU	Set JP3 and DIP SW1 on the main board	2-20
If you plan to provide +5 V or +12 V to COM1 to COM4	Set JP1 on the interconnection board	2-28

When you have finished, reattach the IM module to the cover.

Step 3 - Connecting the TM Printer

The following TM printers can be connected to the IM-515:

- EPSON TM-H5000/H5000II series
- EPSON TM-U950 series

To set up the TM printer itself, see the operator's manual for the TM printer.

Follow these steps to connect the TM printer:

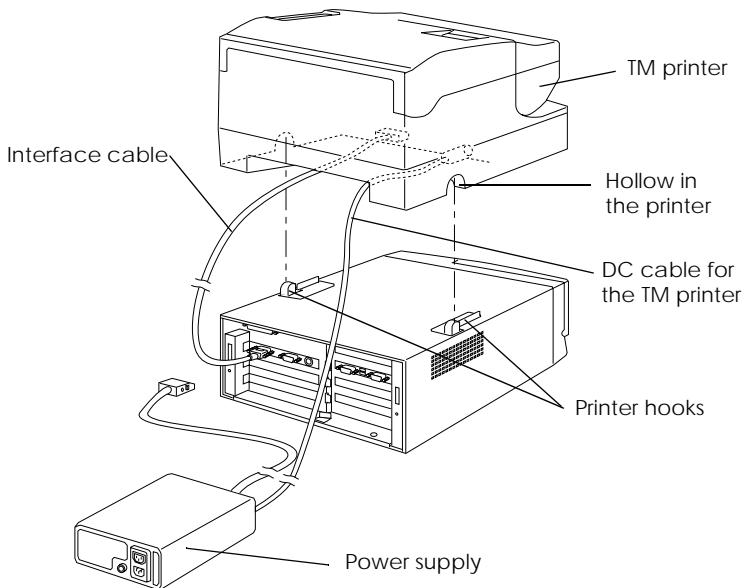


Note:

You need an appropriate interface cable. The interface cable is not enclosed in your IM-515 package.

1. Set the TM printer on the IM-515 so that the printer hooks fit into the hollows in the TM printer.

2. Connect the interface cable to the TM printer, referring to the operator's manual for the TM printer.



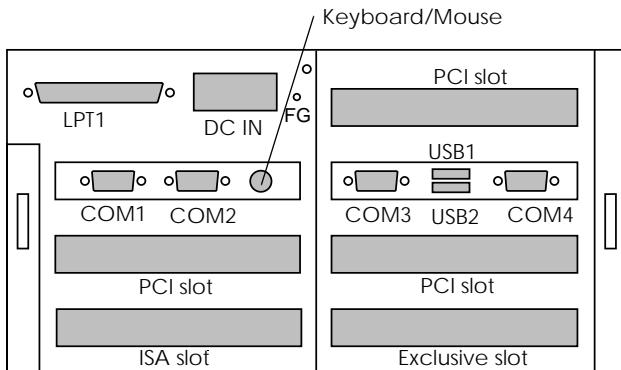
3. Connect the other end of the interface cable to the IM-515.
4. Connect the DC cable of the power supply to the TM printer.

Step 4 - Connecting Your Peripherals

You can connect various peripherals to the IM module using the connectors on the back panel.

⚠ Caution

See Appendix D for power limitations for any device that draws its power from the IM-515.



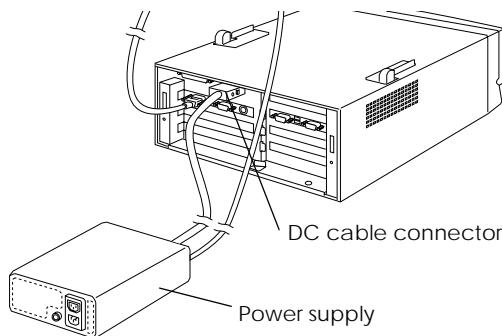
Note:

For some peripherals, you may need to change the jumper settings.
See page 2-28 for more information.

Step 5 - Connecting the Power Supply

Follow these steps to connect the power supply:

1. Make sure you read the safety precautions in this manual.
2. Connect the DC cable connector (rectangular connector) for the power supply to the DC IN connector on the IM-515. Push the connector in as far as it will go.



3. Connect the power cord to the power supply.



Note:

Note that the package does not include a power cord for the power supply. Please obtain an appropriate power cord before using the IM-515.

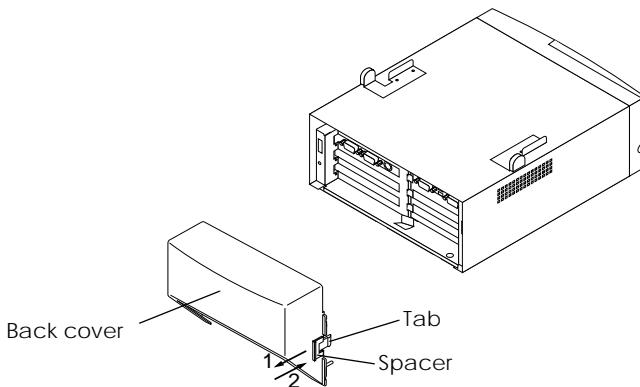
4. Insert the other end of the power cord into an electrical outlet.

See Appendix D for additional information on the power supply.

Step 6 - Attaching the Back Cover

Follow the procedures below to attach the back cover:

1. Remove the tape securing the spacers on both sides of the back cover.
2. Move spacers in the direction indicated by arrow (1).
3. Insert the tab on one side of the cover first; then push the tab on the other side into place.
4. Move the spacers in the direction indicated by arrow (2).



⚠ Caution

Never lift the IM-515 by the back cover. This cover cannot support the weight of the IM-515, so it could drop.

Step 7 - Setting the BIOS Setup Utility

The BIOS setup utility defines how the system is configured. The number of items you need to set depends how you configure the system. This section explains the essential settings for configuring the IM-515.

The first time you setup the IM-515 system, you need to run this program to set the correct date and time. If you installed a floppy disk drive or SIMM, you may need to use this program. If you do not use a floppy or hard disk drive, you also need to run this program.

To start the BIOS setup, turn to page 3-1; then follow the instructions on that page.

Work	See page
Starting the BIOS setup	3-1

Check the table below to see where these procedures are described; then follow the instructions on that page.

Work	You need to	See page
First time setup of the IM-515	Set the date and time using the STANDARD CMOS SETUP menu	3-5
Installing a floppy disk drive	Set the correct type using the STANDARD CMOS SETUP menu	3-6
Not using a floppy disk drive	Set Drive A to "None" in the STANDARD CMOS SETUP menu, and set the Onboard FDC Controller to "Disabled" in the INTEGRATED PERIPHERALS menu	3-6 3-15
Installing a SIMM	Change setting, if you want to use parity SIMMs. Use BIOS FEATURES SETUP menu	3-8
If you do not have a hard disk drive	Set HARD DISKS to "None" in the STANDARD CMOS SETUP menu, and set the On-chip Primary IDE to "Disa bled" in the INTEGRATED PERIPHERALS menu.	3-6 3-14

Step 8 - Setting the Drawer Password

When a cash drawer is connected to the TM printer, you need to set the drawer password. If the password is not set, anyone can open the drawer using the IM-515's device diagnostics utility.

Turn to page 3-26; then follow the instructions on that page.

Work	See page
Defining a drawer password	3-26

Step 9 - Installing your OS or Application software

If you install an OS (operating system) and application software onto the IM-515, perform it in this step.

Step 10 - Charging the Batteries

The IM-515 contains a rechargeable Vanadium-Lithium battery that backs up the real-time clock, CMOS RAM data, and NVRAM data. The battery is not charged fully at the factory. You need to charge the battery before you use the IM-515 for the first time. If you have not used the IM-515 for a long time, you also need to charge the battery.

The battery is being charged when the IM-515 is being turned on. Use the following time table for charging.

Item	Description
Time for full charge	40 hours or more
Backup time	30 days or more (with full charge)

Chapter 2

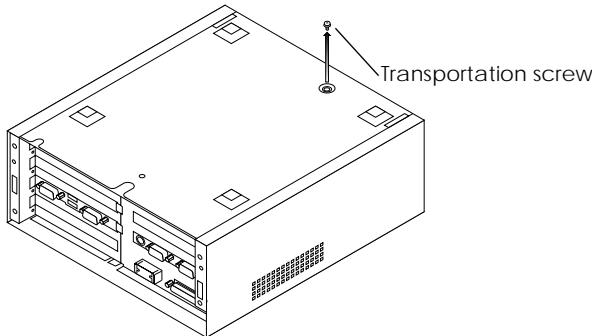
Component Installation

This chapter explains how to install components into the IM-515. The chapter also describes jumper and DIP switch functions.

Removing the Transportation Screw

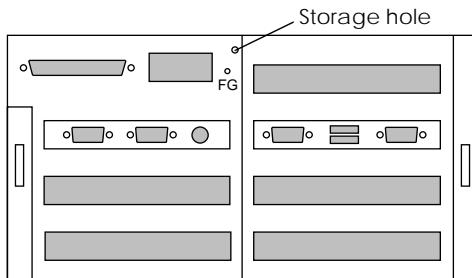
The IM module is secured to the cover during shipping by a transportation screw. Follow these steps to remove this screw:

1. Turn the IM-515 over so the bottom of the unit faces up; then locate the transportation screw.
2. Use a #2 Phillips screwdriver to turn the screw counterclockwise and remove it.



3. Locate the storage hole on the back panel of the IM-515.

4. Screw the transportation screw into the storage hole in the back panel.



⚠ Caution

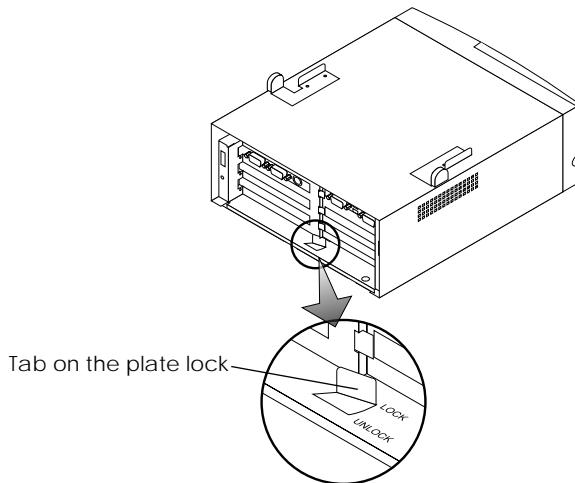
When you transport the IM-515 in its shipping container, make sure you replace the transportation screw to the bottom of the IM-515.

Removing the IM Module from the Cover

Before you can install or remove any components from the IM module or change jumper/DIP switch settings, you need to remove the IM module from the cover. Follow these steps:

1. Make sure the transportation screw has been removed. (See the previous section.)
2. Open the front panel. If it is locked, use the key provided to open the lock.

3. Set the tab on the plate lock to UNLOCK and pull the IM module out, as shown below:



When you are ready to replace the IM module in the cover, slide it in until it is all the way in the cover. Close the front panel, and if necessary, use the key to lock it.

Installing a CPU

The IM module contains a 321-pin ZIF (Zero Insertion Force) Socket 7. The following CPU types can be installed in it:

- Intel Pentium P54C (75 MHz to 200 MHz)
- Intel MMX Pentium P55C (166 MHz to 233 MHz)
- AMD K6-PR166(166MHz) to PR200(200 MHz)

⚠ Caution

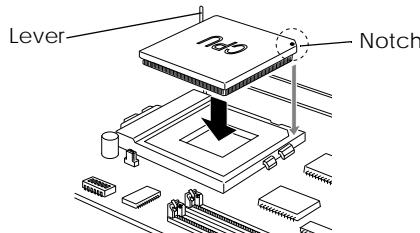
To avoid generating static electricity and damaging the CPU, ground yourself by touching a grounded metal surface before you touch the CPU.

Do not touch CPU pins with your fingers.

Make sure you install the enclosed CPU cooling fan onto the CPU to prevent the CPU from overheating.

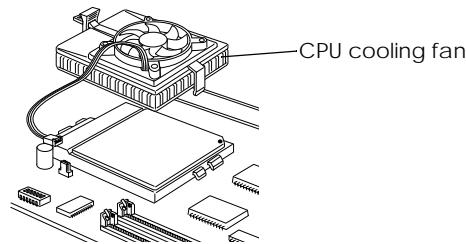
Follow these steps to install the CPU:

1. Make sure you have the CPU cooling fan enclosed in the IM-515 package.
2. Lift the release lever of the Socket 7.
3. Insert the CPU in the Socket 7 in the correct orientation, as shown in the illustration, using the notched corner of the CPU. The notch should point toward the end of the lever. The CPU will fit in only one orientation.

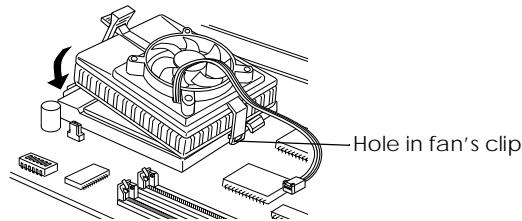


4. Push down the release lever and lock it.
5. Remove the piece of paper from the rubber sheet attached to the bottom surface of the CPU cooling fan. The rubber sheet is a heat sink and must not be removed.

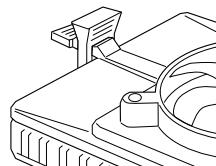
6. Hold the CPU cooling fan in the direction shown below.



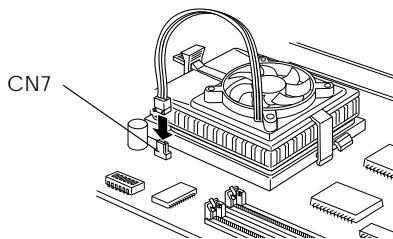
7. Hook the hole in the fan's clip into the notch in the Socket 7.



8. Place the CPU cooling fan on the CPU surface.
9. Push down the opposite side of fan's clip and hook it. Make sure the clip is inserted as shown below; otherwise unclip it and try again.



10. Connect the fan cable to connector CN7. Arrange the cable so cable wires do not touch the fins of either the CPU cooling fan or case fan of the IM-515.



Note:

You must set jumpers and DIP switches for the CPU you installed.

Installing or Removing a SIMM

The main board supports two 72-pin, 32-bit SIMMs (Single Inline Memory Modules) of 4, 8, 16, 32, or 64MB for a memory size between 4MB and 128MB. SIMMs can be either 60ns or 70ns Fast Page Mode (FPM), or Enhanced Data Out (EDO). The system allows installation of a single SIMM. However, it is recommended that you use SIMMs in pairs, both of the same type and capacity.

⚠ Caution

To avoid generating static electricity and damaging the SIMMs, ground yourself by touching a grounded metal surface before you touch a SIMM.

To avoid contamination, do not touch the connectors on the SIMM.



Note:

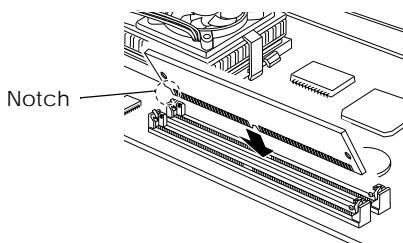
ECC can be supported in the following conditions:

- *Use a pair of parity SIMMs.*
- *Use the BIOS setup and set the Memory Parity/ECC check to "Enabled" in the BIOS Features Setup menu.*

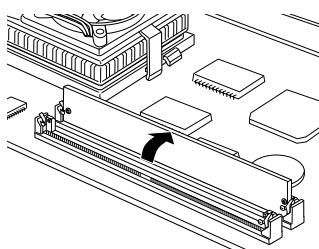
Make sure the SIMMs are the same type and capacity.

Follow these steps to install or remove the SIMMs:

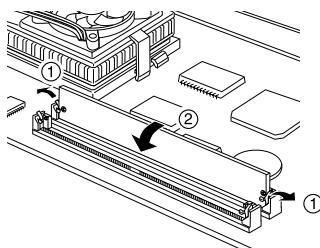
1. Install a SIMM into the inner SIMM socket first. Position the SIMM at a 45 degree angle over the socket. Make sure the notch on the SIMM points toward the CPU, as shown below.



2. Push the SIMM into the socket until it is seated firmly.
3. Tilt the SIMM until it is upright, guiding the hole at each end of the SIMM over the retaining post at each end of the SIMM socket. If it does not go in smoothly, do not force it; pull it all the way out and try again. Make sure the SIMM is properly installed and locked by the tabs on both sides of the socket.



4. Install another SIMM using the procedure above.
5. To remove the SIMM, use your fingers or a small screwdriver to carefully pull away the metal tabs that secure the SIMM at each end. The SIMM falls to the side. Lift it out of the socket. Make sure you store the SIMM in an anti-static bag.



Note:

To use parity SIMMs, you need to enable the "Memory Parity/ECC Check" setting in BIOS setup.

Installing a Hard Disk Drive

You can install a 2.5-inch hard disk drive [19 mm (0.74 inch) high] in the IM module.

⚠ Caution

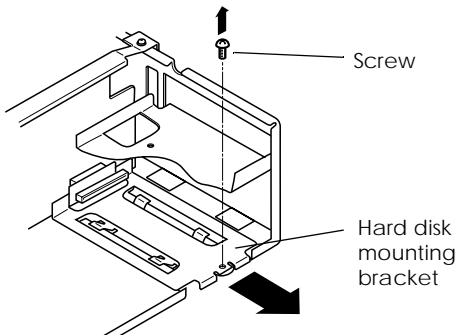
Handle the hard disk drive gently. Small shocks or vibrations could damage the drive.

To avoid contamination, do not touch drive connectors.

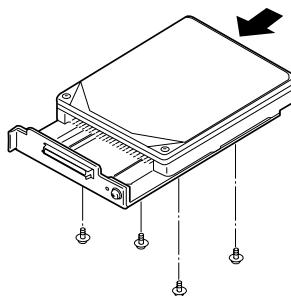
Follow these steps to install the hard disk drive:

1. Make sure you have the four cup head screws enclosed in the IM-515 package.

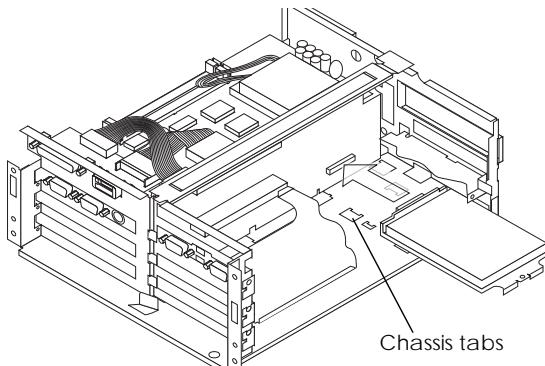
2. Remove the screw fastening the hard disk mounting bracket, and pull it out as shown below.



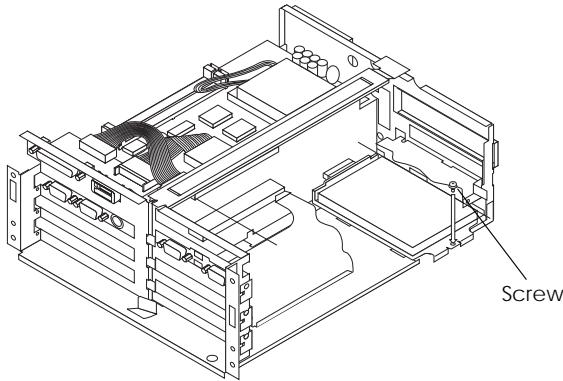
3. Attach the hard disk drive onto the mounting bracket, by sliding the hard disk drive as shown below and fixing it with the four cup head screws enclosed in the IM-515. The tightening torque for all four screws must not exceed 29.4 cN·m (3 kgf·cm).



4. Slide the drive assembly into the chassis so that the notches along the bottom of the drive assembly are under the chassis tabs.



5. Push the drive assembly in gently until you feel the connector fit into place.
6. Secure the mounting bracket to the IM module with the screw you removed in step 2, as shown below.

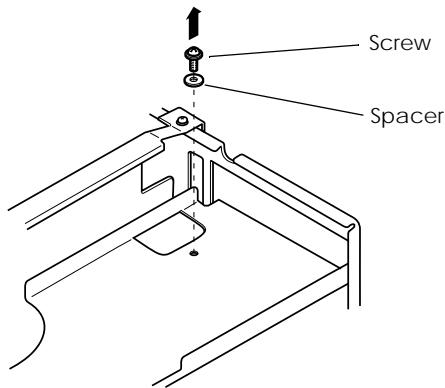


Installing a Floppy Disk Drive

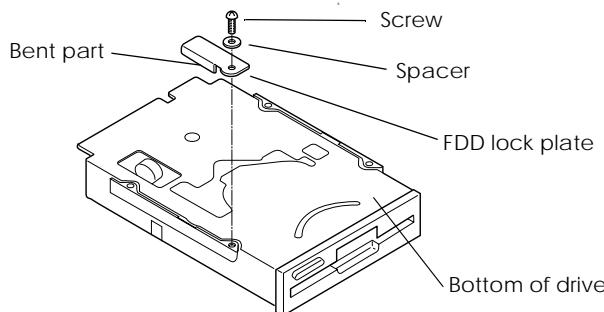
You can install a 3.5-inch floppy disk drive in the IM module.

Follow these steps to install the floppy disk drive:

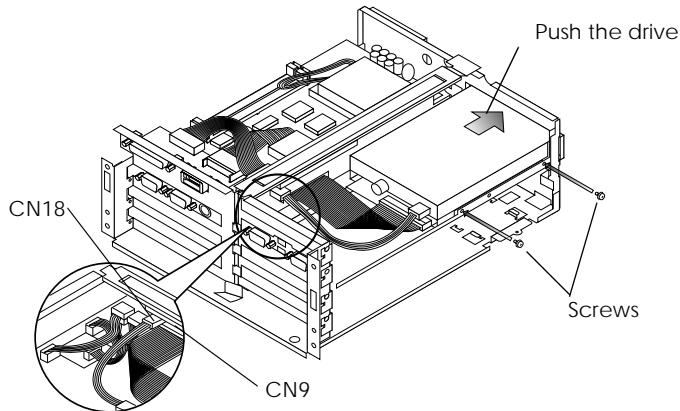
1. Make sure you have the FDD lock plate, FDD ribbon cable, FDD power cable, and the two binding head screws enclosed in the IM-515 package.
2. Remove the floppy disk drive slot cover at the front of the IM module. Remove the screw securing the slot cover to the chassis; then lift the slot cover out. Store the slot cover and screw in case you remove the floppy disk drive later.
3. Remove a spacer and a screw attached to the IM module chassis.



- Secure the spacer and FDD lock plate to the bottom of the floppy disk drive with the screw you removed in the step above. Make sure you attach the FDD lock plate in the correct direction. The bent part should fit as shown below



- Mount the floppy disk drive assembly onto the IM module chassis. Then push the drive assembly toward the front face to meet two screw holes in the floppy disk drive and the IM module chassis.



6. Secure the floppy disk drive assembly with the two binding head screws enclosed in the IM-515 package. See the illustration in step 5.
7. Connect the FDD cables as described in the steps below:
 1. Connect the one end of the FDD ribbon cable to connector CN9 on the IM-515, and connect the other end to the drive. Shape the ribbon cable as shown in the illustration in step 5.
 2. Connect the one end of the FDD power cable to connector CN18 on the IM-515, and connect the other end to the drive. See the illustration in step 5.

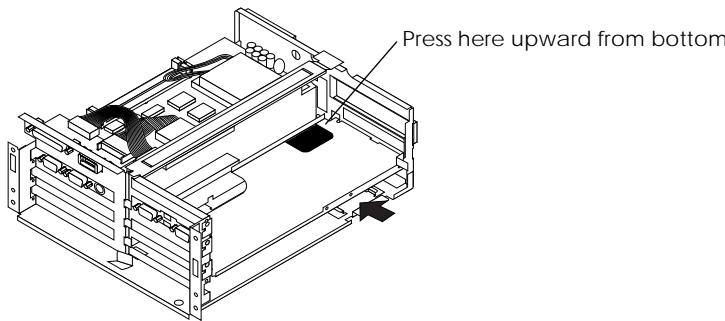


Note:

If you installed a 1.44MB, 3.5-inch drive, you do not need to set the drive type in BIOS setup, because this is the default setting. If you installed any other type of floppy disk drive or do not use a floppy disk drive, you must change the setting using the BIOS setup.

To remove the floppy disk drive, reverse the installation procedure. When you remove the drive from the frame, follow the steps below.

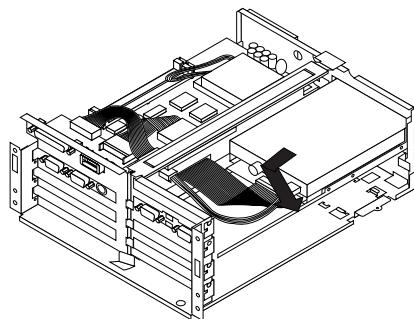
1. Insert your hand under the drive in the place shown with the arrow, and press the insulation sheet upward at the area shown below.



* This illustration does not have the floppy disk drive to show you the portion to press.

By doing this, you unlock the FDD lock plate from the frame.

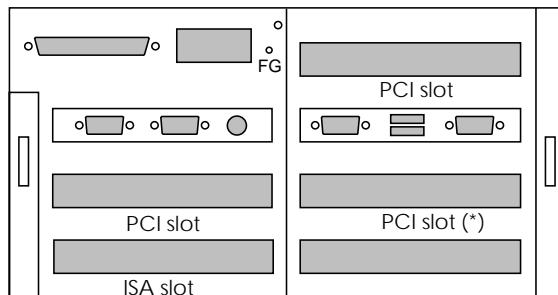
2. Slide the drive toward the arrow shown below to remove it.



Installing a PCI/ISA Card

You can install up to three PCI cards in the PCI expansion slots. You also can install one ISA card in the ISA expansion slot.

The IM-515 does not have an onboard video function, so you must install either an ISA video board or PCI video board before you use the IM-515.



(*) **Note:** When the front PCMCIA expansion module (OI-B05) is used, the maximum length of the card in this slot is 130 mm (5.1")

The maximum size of PCI/ISA cards is as follows:

	Length	Width	Height (Parts side)	Height (Solder side)
Max. size	240 mm/130 mm (9.4/5.1 inches)	107 mm (4.2 inches)	12 mm (0.47 inch)	10 mm (0.39 inch)

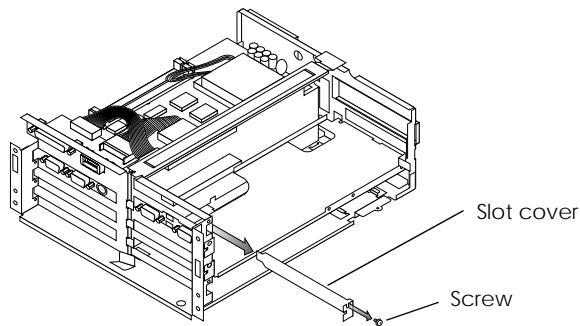
⚠ Caution

When you install PCI/ISA cards, make sure the drawing current of the cards does not exceed the limits shown on page D-7.

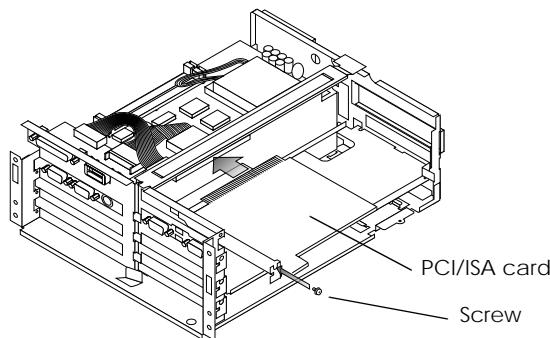
To avoid contamination, do not touch the card connectors.

Follow these steps to install a PCI/ISA card:

1. Remove the screw securing the slot cover. Then slide the slot cover out. Keep the screw to secure the ISA/PCI card to the IM module. Store the slot cover in case you remove the ISA/PCI card later.



2. Gently guide the card into the connector; then push the card in firmly (but carefully) to insert it fully. You should feel the connector fit into place. If the card does not go in smoothly, do not force it; pull it all the way out and try again.



3. Secure the PCI/ISA card to the IM module with the screw you removed in step 1.

Installing a PCMCIA Expansion Module (PC Card Slot)

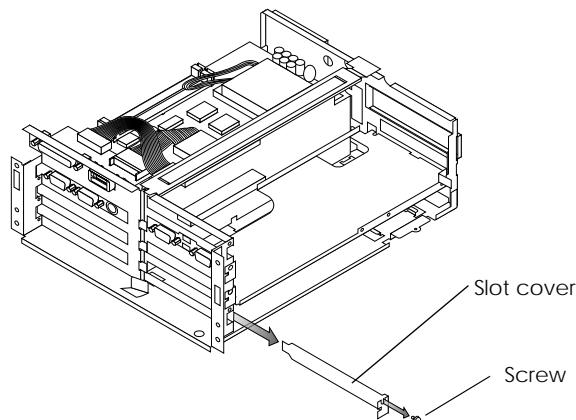
Caution

When you connect PC cards, make sure the drawing current of the cards does not exceed the limits shown on page D-7.

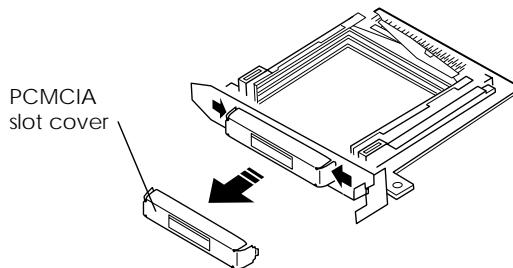
To avoid contamination, do not touch PC card connectors.

Follow these steps to install an expansion module for a PC card.

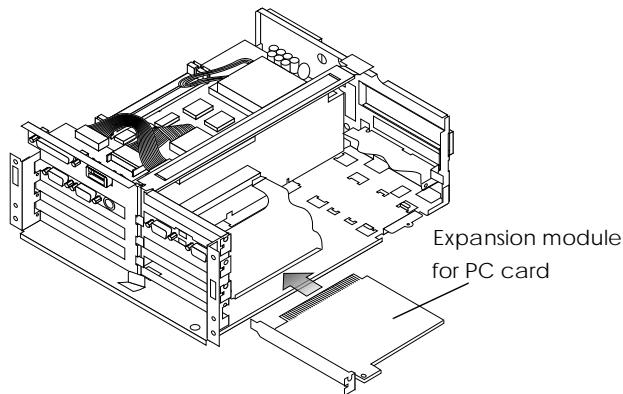
1. Remove the screw securing the slot cover. Then slide the slot cover out. Keep the screw to secure the PCMCIA expansion module to the IM module. Store the slot cover in case you remove the PCMCIA expansion module later



2. Push both sides of the PCMCIA slot cover in, and remove it.



3. Gently guide the module into the connector. Then push the module in firmly (but carefully) to insert it fully. You should feel the connector fit into place. If the card does not go in smoothly, do not force it; pull it all the way out and try again.



4. Secure the PC card module to the IM module with the screw you removed in step 1.
5. Attach the PCMCIA slot cover you removed in step 2. Insert the tab on one side of the PCMCIA slot cover into the notch in the expansion module; then push the tab on the other side into place.



Note:

Remove the PCMCIA slot cover before you install or remove PC cards.

Caution

Make sure you always attach the slot cover to the PC card. The slot cover discharges static electricity in your body. If you do not attach the cover, the IM-515 could lock up when you insert or remove the PC cards.



Note:

You need to setup the PCMCIA driver on your IM-515 before it can recognize PC cards in the slots on the PCMCIA expansion module. See the installation manual for the PC card for details.

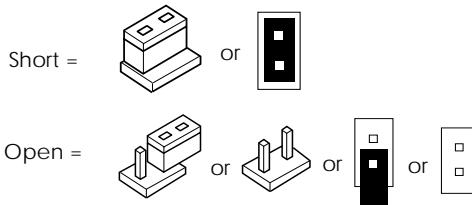
Setting Jumpers/DIP Switches

The IM-515 contains two circuit boards with jumpers or DIP switches you can set. The following sections describe setting the jumpers and DIP switches on each these boards.



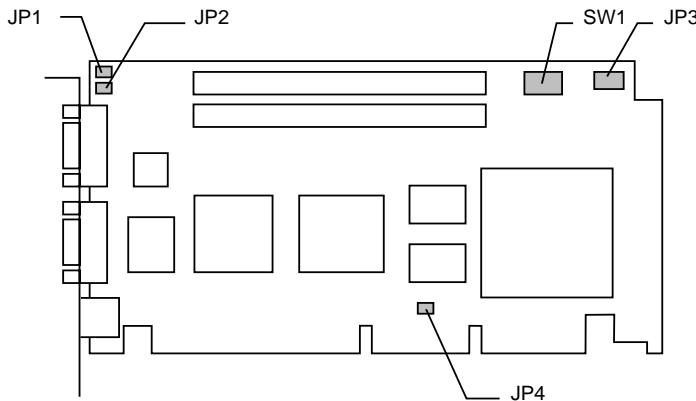
Note:

“Short” in the description below means to connect a pair of pins with a plastic jumper cap. “Open” means the plastic jumper cap is connected to only a single pin or no jumper cap is connected. Settings also are shown graphically below.



Main Board Jumper/DIP Switch Settings

The main board contains four sets of jumpers and a single set of DIP switches.



JP1: Use this jumper to remove NVRAM from the memory map. To do that, set this jumper to “Open.”

JP2: Use this jumper when the system does not boot because of an incorrect BIOS setup. This jumper clears CMOS RAM. No plastic jumper cap is mounted on this jumper. If you want to use the jumper, remove any one of the jumper caps set to “Open” on the main board, and use it for JP2.

Follow the steps below to clear the CMOS RAM.

1. Turn off the IM-515 and remove a jumper cap.
2. Set the JP2 to short.
3. Turn the IM-515 on.
4. Turn off the IM-515 again.
5. Return the jumper cap you removed in step 1.

JP3: This set of jumpers sets the CPU voltage. See the table titled “CPU voltage settings” below for details.

JP4: This jumper switches the modes of the second cache on the main board. Always set this jumper to “Open” (pipelined burst) on the IM-515. No plastic jumper cap is mounted on this jumper.

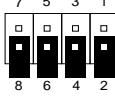
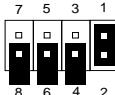
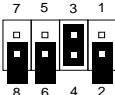
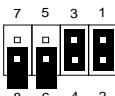
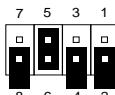
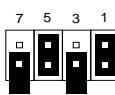
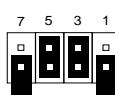
SW1: This set of switches sets the CPU speed. See the table titled “CPU speed settings” below for details.

Main board jumper/DIP switch settings

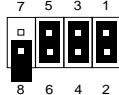
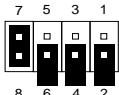
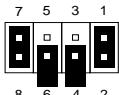
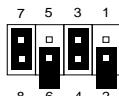
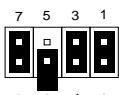
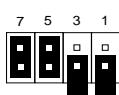
Jumper	Function	Settings	Settings illustrated	Description
JP1	Enabling NVRAM for POS	Open		Disabled
		Short (*)		Enabled
JP2	Clearing CMOS RAM	Open (*)		Normal use
		Short		Clear
JP3	CPU voltage	—	—	See table below.
JP4	Secondary cache mode	Open (*)		Pipelined burst
		Short		Liner burst
SW1	CPU speed	—	—	See table below.

*Factory setting

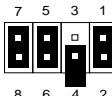
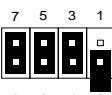
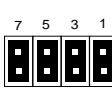
CPU voltage settings

Pins 7 & 8	Pins 5 & 6	Pins 3 & 4	Pins 1 & 2	Settings illustrated	CPU voltage	CPU
Open	Open	Open	Open		2.0 V	
Open	Open	Open	Short		2.1 V	
Open	Open	Short	Open		2.2 V	
Open	Open	Short	Short		2.3 V	
Open	Short	Open	Open		2.4 V	
Open	Short	Open	Short		2.5 V	
Open	Short	Short	Open		2.6 V	

CPU voltage settings

Pins 7 & 8	Pins 5 & 6	Pins 3 & 4	Pins 1 & 2	Settings illustrated	CPU voltage	CPU
Open	Short	Short	Short		2.7 V	
Short	Open	Open	Open		2.8 V	Intel MMX Pentium (166 to 233 MHz)
Short	Open	Open	Short		2.9 V	AMD-K6 (PR166 and PR200)
Short	Open	Short	Open		3.0 V	
Short	Open	Short	Short		3.1 V	
Short	Short	Open	Open		3.2 V	

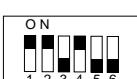
CPU voltage settings

Pins 7 & 8	Pins 5 & 6	Pins 3 & 4	Pins 1 & 2	Settings illustrated	CPU voltage	CPU
Short	Short	Open	Short		3.3 V (*)	Intel Pentium (75 to 200 MHz)
Short	Short	Short	Open		3.4 V	
Short	Short	Short	Short		3.5 V	

*Factory setting

Note: For a CPU that has a dual power sources, voltages listed above apply to the CPU core, and its I/O voltage is always at 3.3 V.

CPU speed settings

CPU	Frequency (MHz)	CPU rate	CPU clock (MHz)	Settings illustrated	CPU rate		CPU clock			
					SW 1-1	SW 1-2	SW 1-3	SW 1-4	SW 1-5	SW 1-6
Intel Pentium	75	1.5 x	50		OFF	OFF	OFF	ON	ON	ON
Intel Pentium	90	1.5 x	60		OFF	OFF	OFF	ON	OFF	OFF
Intel Pentium	100 (*)	1.5 x	66		OFF	OFF	OFF	OFF	OFF	OFF
Intel Pentium	120	2.0 x	60		ON	OFF	OFF	ON	OFF	OFF
Intel Pentium	133	2.0 x	66		ON	OFF	OFF	OFF	OFF	OFF
Intel Pentium	150	2.5 x	60		ON	ON	OFF	ON	OFF	OFF
Intel Pentium	166	2.5 x	66		ON	ON	OFF	OFF	OFF	OFF
Intel Pentium	200	3.0 x	66		OFF	ON	OFF	OFF	OFF	OFF

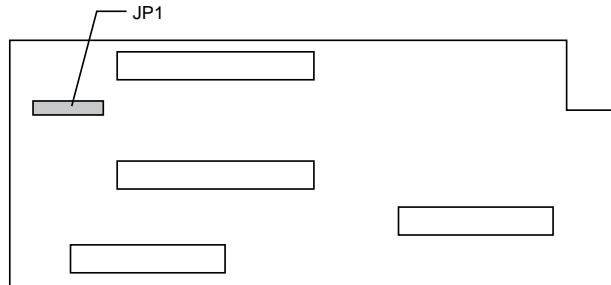
CPU speed settings

CPU	Frequency (MHz)	CPU rate	CPU clock (MHz)	Settings illustrated	SW 1-1	SW 1-2	SW 1-3	SW 1-4	SW 1-5	SW 1-6
Intel MMX Pentium	166	2.5 x	66		ON	ON	OFF	OFF	OFF	OFF
Intel MMX Pentium	200	3.0 x	66		OFF	ON	OFF	OFF	OFF	OFF
Intel MMX Pentium	233	3.5 x	66		OFF	OFF	OFF	OFF	OFF	OFF
AMD-K6 (PR166)	166	2.5 x	66		ON	ON	OFF	OFF	OFF	OFF
AMD-K6 (PR200)	200	3.0 x	66		OFF	ON	OFF	OFF	OFF	OFF

*Factory setting

Interconnection board jumper settings

The interconnection board has JP1, which contains four blocks of jumpers. These jumpers control the function of pin 1 for COM1 to COM4.



Use the information in the following table to change the jumpers on the interconnection board

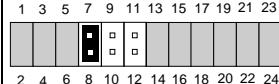
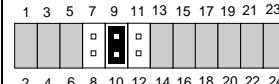
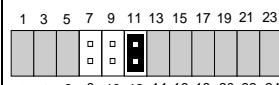
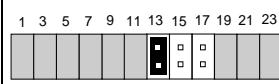
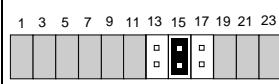
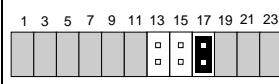
⚠ Caution

Do not short more than two jumpers in the same jumper block; otherwise you may damage the IC chips on the IM-515.

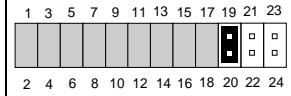
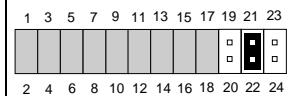
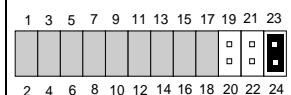
Interconnection board jumper settings

Jumper JP1	Function	Settings	Settings illustrated	Description																																				
Block #1 (pins 1 to 6)	Setting pin 1 of COM1	Pins 1 & 2 Short (*)	<table><tr><td>1</td><td>3</td><td>5</td><td>7</td><td>9</td><td>11</td><td>13</td><td>15</td><td>17</td><td>19</td><td>21</td><td>23</td></tr><tr><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td><td>22</td><td>24</td></tr><tr><td>█</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td></tr></table>	1	3	5	7	9	11	13	15	17	19	21	23	2	4	6	8	10	12	14	16	18	20	22	24	█	□	□	□	□	□	□	□	□	□	□	□	RS-232 DCD signal
1	3	5	7	9	11	13	15	17	19	21	23																													
2	4	6	8	10	12	14	16	18	20	22	24																													
█	□	□	□	□	□	□	□	□	□	□	□																													
Pins 3 & 4 Short	<table><tr><td>1</td><td>3</td><td>5</td><td>7</td><td>9</td><td>11</td><td>13</td><td>15</td><td>17</td><td>19</td><td>21</td><td>23</td></tr><tr><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td><td>22</td><td>24</td></tr><tr><td>□</td><td>█</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td></tr></table>	1	3	5	7	9	11	13	15	17	19	21	23	2	4	6	8	10	12	14	16	18	20	22	24	□	█	□	□	□	□	□	□	□	□	□	□	+5 V		
1	3	5	7	9	11	13	15	17	19	21	23																													
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□	█	□	□	□	□	□	□	□	□	□	□																													
Pins 5 & 6 Short	<table><tr><td>1</td><td>3</td><td>5</td><td>7</td><td>9</td><td>11</td><td>13</td><td>15</td><td>17</td><td>19</td><td>21</td><td>23</td></tr><tr><td>2</td><td>4</td><td>6</td><td>8</td><td>10</td><td>12</td><td>14</td><td>16</td><td>18</td><td>20</td><td>22</td><td>24</td></tr><tr><td>□</td><td>□</td><td>█</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td><td>□</td></tr></table>	1	3	5	7	9	11	13	15	17	19	21	23	2	4	6	8	10	12	14	16	18	20	22	24	□	□	█	□	□	□	□	□	□	□	□	□	+12 V		
1	3	5	7	9	11	13	15	17	19	21	23																													
2	4	6	8	10	12	14	16	18	20	22	24																													
□	□	█	□	□	□	□	□	□	□	□	□																													

Interconnection board jumper settings

Jumper JP1	Function	Settings	Settings illustrated	Description
Block #2 (pins 7 to 12)	Setting pin 1 of COM2	Pins 7 & 8 Short (*)		RS-232 DCD signal
		Pins 9 & 10 Short		+5 V
		Pins 11 & 12 Short		+12 V
Block #3 (pins 13 to 18)	Setting pin 1 of COM3	Pins 13 & 14 Short (*)		RS-232 DCD signal
		Pins 15 & 16 Short		+5 V
		Pins 17 & 18 Short		+12 V

Interconnection board jumper settings

Jumper JP1	Function	Settings	Settings illustrated	Description
Block #4 (pins 19 to 24)	Setting pin 1 of COM4	Pins 19 & 20 Short (*)	 1 3 5 7 9 11 13 15 17 19 21 23 2 4 6 8 10 12 14 16 18 20 22 24	RS-232 DCD signal
		Pins 21 & 22 Short	 1 3 5 7 9 11 13 15 17 19 21 23 2 4 6 8 10 12 14 16 18 20 22 24	+5 V
		Pins 23 & 24 Short	 1 3 5 7 9 11 13 15 17 19 21 23 2 4 6 8 10 12 14 16 18 20 22 24	+12 V

*Factory settings

Chapter 3

Using the System Utilities

The IM-515 comes with the following utility programs in system ROM:

- ❑ BIOS setup, for defining the system configuration.
- ❑ Device diagnostics, for troubleshooting devices attached to the IM-515.

These programs and the factory default options for this IM-515 are stored in ROM. New configuration settings are stored in CMOS RAM, which is backed up by a battery.

Using BIOS Setup

BIOS setup defines how the system is configured. You need to run this program the first time you configure the IM-515. You need to run it again if you change the configuration.

Caution

Do not change setting values not described here. Changing them creates the possibility that the IM-515 may not work. If this happens, see "In Case of Problems" on page 3-3.

Starting BIOS Setup

Follow these steps to start BIOS setup:

1. Turn on or reset the system.

2. Press the Delete key immediately after switching the system on, or press Delete when the following message appears briefly at the bottom of the screen:

PRESS DEL TO ENTER SETUP.

3. If a supervisor password is set, a message appears in the center of the screen:

ENTER PASSWORD

Type the supervisor password, and press Enter.

4. The BIOS setup starts.

Setup Keys

The following table shows how to navigate in setup using the keyboard.

Key functions

Key	Function
Arrow keys	Select an item.
Esc key	Main Menu: Quit and do not save changes to CMOS RAM. Status Page Setup Menu and Option Page Setup Menu: Exit current page and return to Main Menu
PgUp key or + key	Increase the numeric value or make changes
PgDn key or - key	Decrease the numeric value or make changes
F1 key	General help, only for Status Page Setup Menu and Option Page Setup Menu
F2 key or Shift+F2	Change color from a total of 16 colors. F2 to select color forward, Shift+F2 to select color backward
F5 key	Restore the previous CMOS value from CMOS, only for Option Page Setup Menu
F6 key	Load the BIOS defaults, only for Option Page Setup Menu
F7 key	Load the Setup defaults
F10 key	Save all the CMOS changes, only for Main Menu

Getting Help

Press F1 to pop up a small help window that describes the possible selections. To exit the Help Window press Esc or the F1 key again.

In Case of Problems

If, after making and saving system changes in setup, you discover that your computer no longer boots, clear the CMOS RAM using the jumper JP2 on the main board. See page 2-20 for the instructions to clear the CMOS RAM.

Main Menu

When you enter the BIOS setup utility, a main menu appears on the screen. Use the arrow keys to highlight items and press Enter to accept and enter the sub-menu. A brief description of each highlighted selection appears at the bottom of the screen.

The following is a brief summary of the items you can set.

Brief description of main menu

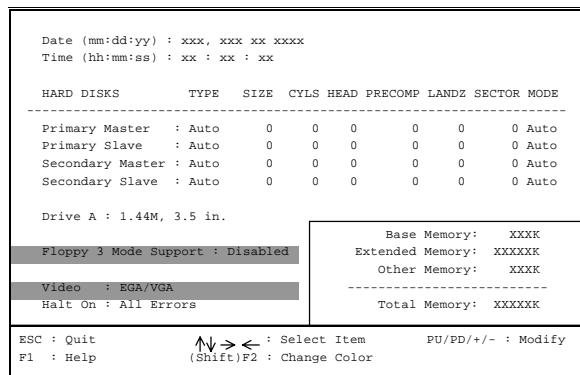
Items you can set	Descriptions
STANDARD CMOS SETUP	Options in the original PC AT-compatible BIOS.
BIOS FEATURES SETUP	Enhanced BIOS options.
POWER MANAGEMENT SETUP	Advanced Power Management (APM) options.
LOAD BIOS DEFAULTS	BIOS defaults are the settings for the most stable, minimal-performance system operations. These settings make the system boot-up stable. However, system performance may not be optimized.
LOAD SETUP DEFAULTS	Setup defaults are factory settings for the IM-515.
INTEGRATED PERIPHERALS	I/O subsystems that depend on the integrated peripherals controller in your system.
SUPERVISOR PASSWORD	Change, set, or disable a password. The supervisor password permits access to BIOS setup.

Brief description of main menu

Items you can set	Descriptions
USER PASSWORD	Change, set, or disable a password. The user password allows power-on access.
SAVE & EXIT SETUP	Save settings in the CMOS RAM and exit setup.
EXIT WITHOUT SAVING	Abandon all changes and exit setup.

Standard CMOS Setup

When you enter Standard CMOS Setup, the following menu appears on the screen. Do not change the settings for the shaded items (Note that the actual screen does not have this shading.)



The following describes items you can set on this menu.

Standard CMOS setup

Items you can set	Options (*) : SETUP defaults (**): BIOS defaults	Descriptions
Date	---	Press the right or left arrow key to move to the desired field (date, month, year). Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.
Time	---	The time format is based on a 24-hour clock. For example, 1 p.m. is 13:00:00. Press the right or left key to move to the desired field. Press the PgUp or PgDn key to increment the setting, or type the desired value into the field.

Standard CMOS setup

Items you can set	Options (*) : SETUP defaults (**): BIOS defaults	Descriptions
HARD DISKS	Auto (*) User None (**)	Sets the HDD type. Auto: The system checks the HDD and set the type automatically. User: You can set each parameters. None: If you do not use the HDD, select this option.
Drive A	None (**) 360KB, 5.25 in. 1.2MB, 5.25 in. 720KB, 3.5 in. 1.44MB, 3.5 in. (*) 2.88MB, 3.5 in.	You can use this to select the correct specifications for the floppy disk drive installed in the IM-515. If you do not use a floppy disk drive, select None.
Halt On	All Errors (*),(**) No Errors All, But Keyboard All, But Diskette All, But Disk/Key	<p>During the power on self test (POST), the system stops if BIOS detects a hardware error. You can tell BIOS to ignore certain errors during POST and continue the boot-up process. These are the selections:</p> <p>All Errors: If BIOS detects any non-fatal error, POST stops and prompts you to take corrective action.</p> <p>No Errors: POST does not stop for errors.</p> <p>All, But Keyboard: POST does not stop for a keyboard error, but stops for all other errors.</p> <p>All, But Diskette: POST does not stop for floppy disk drive errors, but stops for all other errors.</p> <p>All, But Disk/Key: POST does not stop for a keyboard or disk error, but stops for all other errors.</p>

BIOS Features Setup

When you enter BIOS Features Setup, the following menu appears on the screen. Do not change the settings for the shaded items (Note that the actual screen does not have this shading.)

Virus Warning	:	Disabled	Video BIOS Shadow	:	Enabled
CPU Internal Cache	:	Enabled	C8000-CBFFF Shadow	:	Disabled
External Cache	:	Enabled	CC000-CFFFF Shadow	:	Disabled
Quick Power On Self Test	:	Enabled	D0000-D3FFF Shadow	:	Disabled
Boot Sequence	:	A,C,SCSI	D4000-D7FFF Shadow	:	Disabled
Boot Up Floppy Seek	:	Disabled	D8000-DBFFF Shadow	:	Disabled
Boot Up NumLock Status	:	On	DC000-DFFFF Shadow	:	Disabled
Boot Up System Speed	:	High			
Gate A20 Option	:	Fast			
Memory Parity/ECC Check	:	Disabled	ESC : Quit	N > < :	Select Item
Typematic Rate Setting	:	Disabled	F1 : Help	PG/PG/+/- :	Modify
Typematic Rate (Chars/Sec)	:	6	F5 : Old Value (Shift)	F2 : Color	
Typematic Delay (Msec)	:	250	F6 : Load BIOS Defaults		
Security Option	:	Setup	F7 : Load Setup Default		
PS/2 mouse function control	:	Enabled			
POL/VGA Palette Snoop	:	Disabled			
OS Select For DRAM > 64MB	:	Non-OS2			
Report No FDD For WIN 95	:	No			

The following describes the items you can set on this menu.

BIOS Features Setup

Items you can set	Options (*): SETUP defaults (**): BIOS defaults	Descriptions
Virus Warning	Enabled Disabled (*), (**)	When this setting is Enabled, you receive a warning message if a program (specifically, a virus) attempts to write to the boot sector or the partition table of the hard disk drive. Keep in mind that this feature protects only the boot sector, not the entire hard drive.
Quick Power On Self Test	Disabled (**) Enabled (*)	Select Enabled to activate the quick POST.
Boot Sequence	A, C, SCSI (*), (**) C, A, SCSI D, A, SCSI E, A, SCSI F, A, SCSI SCSI, A, C SCSI, C, A C only	The original IBM PCs loaded the operating system from drive A (a floppy disk), so IBM PC-compatible systems are designed to search for an operating system first on drive A, and then on drive C (hard disk). However, the BIOS now offers a large number of boot devices and boot sequence options.
Boot Up Floppy Seek	Disabled (*) Enabled (**)	When this setting is Enabled, the floppy disk drive seeks during boot up.
Boot Up NumLock Status	Off (**) On (*)	Toggles between On or Off to control the state of the Num Lock key when the system boots.
Memory Parity/ECC Check	Disabled (*), (**) Enabled	To use parity for the SIMMs, select Enabled.
Typematic Rate Setting	Disabled (*), (**) Enabled	When this setting is Disabled, the following two items (Typematic Rate and Typematic Delay) are irrelevant. Keystrokes repeat at a rate determined by the keyboard controller in your system.
Typematic rate (Char/Sec)	6 (*), (**) 8 10 12 15 20 24 30	When the typematic rate setting is enabled, you can select a typematic rate (the rate at which character repeats when you hold down a key) of 6, 8, 10, 12, 15, 20, 24 or 30 characters per second.

BIOS Features Setup

Items you can set	Options (*): SETUP defaults (**): BIOS defaults	Descriptions
Typematic Delay (Msec)	250 (*), (**) 500 750 1000	When the typematic rate setting is enabled, you can select a typematic delay (the delay before key strokes begin to repeat) of 250, 500, 750 or 1000 milliseconds.
Security Option	Setup (*), (**) System	You can set passwords in one of two ways below: Setup: You must enter a supervisor password to enter BIOS setup. System: You need to enter a user password each time the system boots. You also must enter a supervisor password to enter BIOS setup.
PS/2 mouse function control	Disabled Enabled (*), (**)	If you use a PS/2 mouse, select Enabled. IRQ12 will be used for the PS/2 mouse. Disabled will reserve IRQ12 for expansion cards and the PS/2 mouse will not function.
OS Select For DRAM > 64MB	Non-OS2 (*), (**) OS2	You should select OS2 only if you are running the OS/2 operating system with greater than 64MB of RAM on your system.
C8000-CBFFF Shadow	Disabled (*), (**) Enabled	Selects whether to permit shadowing in this section of memory.
CC000-CFFFF Shadow	(Same as above)	(Same as above)
D0000-D3FFF Shadow	(Same as above)	(Same as above)
D4000-D7FFF Shadow	(Same as above)	(Same as above)
D8000-DBFFF Shadow	(Same as above)	(Same as above)
DC000-DFFFF Shadow	(Same as above)	(Same as above)

Power Management

When you enter Power Management Setup, the following menu appears on the screen. Do not change the settings the shaded items. (Note that the actual screen does not have this shading.)

Global PM Timers : Disabled	** Thermal Monitor **
PM Control by APM : Yes	CPU Warning Temperature : 60C/140F
MODEM Use IRQ : 3	Current CPU Temperature : xxxxC/xxxxF
Suspend Option : Static Suspend	Current System Temp. : xxxxC/xxxxF
Beep On Suspend : Disabled	** Fan Speed Monitor **
Video Off Option : Suspend -> Off	Current CPU FAN Speed : xxxx RPM
Video Off Method : DPMS Support	Current CASE FAN Speed : xxxx RPM
** PM Timers **	** Voltage Monitor **
HDD Power Down : 15 Min	VCORE Voltage : xx.xx V
Doze mode : Disabled	+3.3V Voltage : x.xx V
Standby Mode : Disabled	+5V Voltage : x.xx V
Suspend Mode : Disabled	+12V Voltage : xx.xx V
** Timer Reload & Wakeup Events **	-12V Voltage : -xx.xx V
Primary HDD : Disabled	-5V Voltage : -x.xx V
Floppy : Disabled	
Serial Ports : Enabled	ESC : Quit  : Select Item
Keyboard : Enabled	F1 : Help PU/PD/+/ - : Modify
Parallel Ports : Disabled	F5 : Old Value (Shift)F2 : Color
** External Switch **	F6 : Load BIOS Defaults
Power Button : Green Mode	F7 : Load Setup Default

The following describes the items you can set on this menu.

Power Management

Items you can set	Options (*): SETUP defaults (**): BIOS defaults	Descriptions
Global PM Timers	User Define Disabled (*), (**) Min Saving Max Saving	Selects power management functions using the timers for doze, standby, and suspend. User Define: You can set the time for each timer. Disabled: When you select Disabled, power management features for doze, standby, and suspend are disabled. Min Saving: The system sets the timers as following. Doze timer: 10 min Standby timer: 30 min Suspend timer: 1 hour Max Saving: The system sets the timers as following. Doze timer: 1 min Standby timer: 2 min Suspend timer: 3 min
PM Control by APM	No Yes (*), (**)	This item allows you to set power management without using APM (Advanced Power Management).
Modem Use IRQ	NA (**) 3 (*) 4 5 7 9 10 11	Set the interrupt that the modem uses. When the interrupt chosen in this item occurs, the system returns to working mode from suspend mode. If you do not use this feature, select NA.
Beep On Suspend	Disabled (*), (**) Once 1 Min Interval	This option controls the beep for suspend mode. See Appendix B for detail.

Power Management

Items you can set	Options (*): SETUP defaults (**): BIOS defaults	Descriptions
Video Off Option	Always ON Suspend -> Off (*) Susp, Stby -> Off (**) All Modes -> Off	This option determines when to activate the video off feature. Always ON: The video off feature is disabled. Suspend -> Off: When the system enters suspend mode, the video off feature goes active. Susp, Stby -> Off: When the system enters suspend or standby mode, the video off feature goes active. All Modes -> Off: The video off feature goes active in all power management modes.
Video Off Method	Blank Screen V/H SYNC+Blank DPMS Support (*), (**)	Set this field for your video card and monitor.
HDD Power Down	Disabled (**) 1 min -- 15 min (*)	This field allows you to set the period of inactivity before the hard disk drive enters standby mode (motor power is off). You can select Disabled to keep the hard disk drive running continually.
Doze Mode	Disabled (*), (**) 1 min -- 10 min 20 min 30 min 40 min 50 min 1 hour	This field sets the period of inactivity before the CPU enters doze mode.

Power Management

Items you can set	Options (*): SETUP defaults (**): BIOS defaults	Descriptions
Standby Mode	Disabled (*), (**) 1 min -- 10 min 20 min 30 min 40 min 50 min 1 hour	This field sets the period of inactivity before the system goes into standby mode from doze mode.
Suspend Mode	Disabled (*), (**) 1 min -- 10 min 20 min 30 min 40 min 50 min 1 hour	This field sets the period of inactivity before the system goes into suspend mode from standby mode.
Primary HDD	Disabled (*), (**) Enabled	If you select Enabled, the system returns to working mode from the power saving modes (doze, standby, or suspend modes) when this device is accessed.
Floppy	Disabled (*), (**) Enabled	(Same as above.)
Serial Ports	Disabled (**) Enabled (*)	(Same as above.)
Keyboard	Disabled(**) Enabled(*)	(Same as above.)
Parallel Ports	Disabled(*),(**) Enabled	(Same as above.)
Power Button	Disabled(**) Green Mode(*) Power OFF	Set the power switch functions. See Appendix B for details.

Integrated Peripherals

When you enter the Integrated Peripherals menu, the following appears on the screen. Do not change the settings for the items in dark shading. The items with light shading may not appear on the screen, depending on the settings of other items. (The actual screen does not have this shading.)

On-Chip Primary IDE	: Enabled	Onboard Parallel Port	: 378/IRQ7
On-Chip Secondary IDE	: Disabled	Parallel Port Mode	: SPP
IDE Primary Master PIO	: Auto	ECP Mode Use DMA	: 3
IDE Primary Slave PIO	: Auto		
IDE Secondary Master PIO	: Auto		
IDE Secondary Slave PIO	: Auto		
IDE Primary Master UDMA	: Auto		
IDE Primary Slave UDMA	: Auto		
IDE Secondary Master UDMA	: Auto		
IDE Secondary Slave UDMA	: Auto		
IDE HDD Block Mode	: Enabled		
On-Chip USB Controller	: Disabled	ESC : Quit	→ ← : Select Item
USB Keyboard Support	: Disabled	F1 : Help	PU/PD/+/- : Modify
Onboard FDC Controller	: Enabled	F5 : Old Value	(Shift)F2 : Color
Onboard Serial Poer 1	: 3F8/IRQ4	F6 : Load BIOS Defaults	
Onboard Serial Poer 2	: 2F8/IRQ3	F7 : Load Setup Default	
Onboard Serial Poer 3	: 3E8/IRQ11		
Onboard Serial Poer 4	: 2E8/IRQ10		

The following describes the items you can set on this menu.

Integrated Peripherals

Items you can set	Options (*): SETUP defaults (**): BIOS defaults	Descriptions
On-Chip Primary IDE	Disabled Enabled (*),(**)	Select Enabled to activate the IDE interface.
On-Chip Secondary IDE	Disabled (*),(**) Enabled	Select Enabled to activate the secondary IDE channel.
IDE Primary/Secondary Master/Slave PIO	Auto (*),(**) Mode 0 Mode 1 Mode 2 Mode 3 Mode 4	The four IDE PIO (Programmed Input/Output) fields let you set a PIO mode (0-4) for each of the four IDE devices that the onboard IDE interface supports. Modes 0 through 4 provide successively increased performance. In Auto mode, the system automatically determines the best mode for each device.

Integrated Peripherals

Items you can set	Options (*): SETUP defaults (**): BIOS defaults	Descriptions
IDE Primary/ Secondary Master/Slave UDMA	Disabled (**) Auto(*) Mode 0 Mode 1 Mode 2	If your hard drive and your system software both support Ultra DMA, select Auto to enable BIOS support.
On-Chip USB Controller	Disabled(*),(**) Enabled	Select Enabled to activate the USB controller.
USB Keyboard Support	Disabled(*),(**) Enabled	Select Enabled when you use a USB keyboard.
Onboard FDC Controller	Disabled Enabled (*),(**)	Select Enabled to use the onboard floppy disk controller (FDC) on the main board. If you install an add-in FDC or the system has no floppy drive, select Disabled in this field.
Onboard Serial Port 1/2	Disabled 3F8, IRQ4 2F8, IRQ3 3E8, IRQ11 2E8, IRQ10 338, IRQ11 238,IRQ10	Select an address and corresponding interrupt for the serial ports. Here are the SETUP/BIOS default settings for each port: Port 1: 3F8, IRQ4 Port 2: 2F8, IRQ3
Onboard Serial Port 3/4	Disabled 3F8, IRQ4 2F8, IRQ3 3E8, IRQ4 2E8, IRQ3 3E8, IRQ11 2E8,IRQ10	Select an address and corresponding interrupt for the serial ports. Here are the SETUP/BIOS default settings for each port. Port 3: 3E8, IRQ11 Port 4: 2E8, IRQ10

Integrated Peripherals

Items you can set	Options (*): SETUP defaults (**): BIOS defaults	Descriptions
Onboard Parallel Port	Disabled 3BC, IRQ7 378, IRQ7 (*),(**) 278, IRQ5	Select an address and corresponding interrupt for the parallel port.
Parallel Port Mode	PS/2 EPP1.9 ECP ECPEPP1.9 SPP (*),(**) EPP1.7 ECPEPP1.7	Select an operating mode for the parallel port. SPP: Standard Parallel Port (data flows from PC to peripheral only) PS/2: Bidirectional
ECP Mode Use DMA	0 1 3 (*),(**)	When the parallel port is set to ECP mode, this field determines a DMA channel for the port.

Supervisor/User Password Setting

Follow these steps to set the supervisor or user password.

1. Select Supervisor Password or User Password item on the main menu screen, and press Enter.

To abort the process at any time, press Esc.

To clear the password, simply press Enter when asked to enter a password. Then the password function is disabled.

2. A message appears at the center of the screen:

ENTER PASSWORD:

Type a password up to eight characters and press Enter.
Typing a password clears any previously entered password from CMOS memory.

3. Now the message changes:

CONFIRM PASSWORD:

Again, type the password and press Enter.

4. In the security option item in the BIOS features setup screen, select Setup or System.

Setup	You need to enter a supervisor password whenever you enter the BIOS Setup.
System	You need to enter a user password each time the system boots. You also need to enter a supervisor password whenever you enter the BIOS Setup.

Using Device Diagnostics

The device diagnostics utility included in IM -515 system ROM lets you isolate communication problems that the IM-515 or connected devices may be having. You can use these diagnostics to test the following:

- TM printer operation test
- DM display indication test
- Cash drawer operation test
- Serial port loop-back test
- LPT1 port loop-back test
- Printing test of printer connected to LPT1.

Device Diagnostics Utility Conditions

The device diagnostics utility runs under the following conditions.

Device Diagnostics Utility Conditions

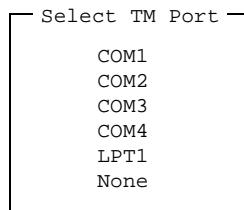
Items	Conditions
Setting of the TM printer DIP switches	<input type="checkbox"/> Set the receive buffer to the maximum. <input type="checkbox"/> Set the selection switch for customer display connection/non-connection to non-connection (if it has a selection switch). <input type="checkbox"/> Setup the communication settings to follow the instruction, if the TM printer does not have the ID function (ESC/POS GS I command). Baud Rate: 9600 bps Word Length: 8 bits Parity: None See the TM printer manual for the setup procedure.
Setting of DIP switch of the DM displays	When the TM printer connects to COM1: <input type="checkbox"/> Setup the communication setting to follow the instruction, for a TM printer with ID function (ESC/POS GS I command). Baud Rate: Same setting as the TM printer Word Length: Same setting as the TM printer Parity: Same setting as the TM printer <input type="checkbox"/> Setup the communication setting to follow the instruction, when the TM printer does not have the ID function (ESC/POS GS I command). Baud Rate: 9600 bps Word Length: 8 bits Parity: None When the TM printer connects to another port besides COM1: <input type="checkbox"/> Setup the DM display communication setting to follow the instruction. Baud Rate: 9600 bps Word Length: 8 bits Parity: None See the DM display manual for the setup procedures

Starting Device Diagnostics

When you start the IM-515, you see the following prompt.

Press F10-Key to start device diagnostics.

When you see the prompt, press F10. You see the following dialog box when you start the device diagnostics utility.



Select the port connected to the TM printer, using the up arrow or down arrow key; then press Enter. If you have not connected a TM printer, select **None**.

You see the device diagnostics screen.

Device diagnostics uses a series of menu bars, pull-down menus, and dialog boxes that allow you to select options or perform diagnostic tests. Follow these guidelines for using device diagnostics:

- ❑ To display a pull-down menu, use the left arrow or right arrow key to highlight the option; then press Enter (if necessary). You can also see the pull-down menu if you press the key that corresponds to the initial letter of the option. (The **Initialize** option does not have a pull-down menu.)
- ❑ To select an option from the pull-down menus, use the up arrow or down arrow key to highlight the option; then press Enter. If the option has a dialog box, you see it when you press Enter.
- ❑ Press Esc to close a pull-down menu or a dialog box.
- ❑ Press the backspace key to correct typing.

Device Diagnostics Screen

The device diagnostics screen is divided into the following areas:

- TM/drawer
- DM
- COM ports
- LPT1
- Messages.

TM/Drawer

The TM/drawer area of the device diagnostics screen displays the communication settings, cash drawer driving pulse signal width, and the status for the TM printer and cash drawer.

TM/DM information

Setting	Description
TM Model	Displays the model name, depending on the type of TM printer attached to the IM-515.
TM Port	Displays the TM printer connection support that was selected when you started the device diagnostics utility.
TM Reset Signal	Indicates the signal name the system will use to reset the TM printer. This feature functions if the TM printer has been set to allow reset using the RTS or DTR signals.
Baud Rate	Indicates the baud rate that the TM printer is using.
Word Length	Indicates the word length that the TM printer is using.
Parity	Indicates whether the TM printer is using parity.
Drawer On Time	Displays the pulse width of the signal for opening the cash drawer.
TM Status	Indicates the status of the TM printer. See the table below called "TM status messages" for a description of these messages.
Drawer Status	Displays the status (HIGH/LOW) of the cash drawer.

TM status messages

Message	Priority (*)	Description
Disabled	—	<p>The port connected to the TM printer is disabled. Set to Enabled using the BIOS Setup.</p>
No communication	—	<p> <input type="checkbox"/> Displays this message when a TM printer that does not have an ID function (ESC/POS GS I command) is connected. Check whether the DIP switches of the TM printer are set to the following: Baud Rate: 9600 bps Word Length: 8 bits Parity: None Although the screen indicates "No communication," the device diagnostics utility can communicate with the TM printer if the DIP switches are set up correctly. If something is wrong, check the TM status messages. </p> <p> <input type="checkbox"/> The device diagnostics utility cannot communicate with a connected TM printer that has the ID function (ESC/POS GS I command). Check the following items: </p> <ul style="list-style-type: none"> <input type="checkbox"/> The interface cable and power cable are connected properly to the TM printer. <input type="checkbox"/> Make sure you turn off the IM-515 before you connect the cable. <input type="checkbox"/> The TM printer power switch is on. <input type="checkbox"/> The TM printer selected when device diagnostics started is connected to the port. <input type="checkbox"/> The TM printer is not performing a self-test when the device diagnostics utility starts. <input type="checkbox"/> The paper FEED button is not pressed when the device diagnostics utility starts. <input type="checkbox"/> The TM printer is on-line. <p>If the TM printer does not meet these conditions, correct the problem and select the Initialize option from the menu bar.</p> <p>If the printer meets all the above conditions, one of the following may have occurred:</p> <ul style="list-style-type: none"> <input type="checkbox"/> The print head has overheated. <input type="checkbox"/> The TM printer is not working.
Hardware error	1	The print head is overheated, or the printer is not working.

TM status messages

Message	Priority (*)	Description
Paper feeding	2	The TM printer is feeding paper.
Receipt end	3	The receipt paper path contains no paper.
Journal end	4	The journal paper path contains no paper.
Paper near-end	5	The paper roll diameter is too small, or it is not installed.
Receipt near-end	6	The receipt paper roll diameter is too small, or it is not installed.
Journal near-end	7	The journal paper roll diameter is too small, or it is not installed.
Cover open	8	The printer cover is open.
On-line	9	The printer is on-line. The TM print test is possible.

(*) If device diagnostics detects more than one TM status, it displays the highest priority message. (Priority code 1 is higher than priority code 3.)

DM

The DM area on the screen indicates the communication settings and the status of the DM display.

DM Information

Setting	Description
DM port	Indicates the port that the device diagnostics utility uses to transmit data.
Baud Rate	Indicates the baud rate that the DM display uses.
Word Length	Indicates the word length that the DM display uses.
Parity	Indicates whether the DM display uses parity.
DM status	Indicates DM status. See the table "DM status messages" below, which explains of these messages.

DM status messages

Message	Description
Disabled	The port connected to the DM display is disabled. Set to Enabled using BIOS setup.
No communication	<p>Device diagnostics is not able to communicate with the DM display. Check the TM printer and DM display for the following:</p> <ul style="list-style-type: none"><input type="checkbox"/> The DM display is properly connected. Make sure you turn off the IM-515 before you connect the cable.<input type="checkbox"/> The data communications DIP switch is the same for the DM display and the TM printer. Make sure you turn off the IM-515 before you change the settings.<input type="checkbox"/> The DM display power switch is on.<input type="checkbox"/> The DM display is not executing a self test. <p>If the DM display does not meet these conditions, correct the problem and select the Initialize option from the menu bar.</p> <p>If the TM printer and DM display meet the above conditions, one of the following may have occurred:</p> <ul style="list-style-type: none"><input type="checkbox"/> The DM display interface circuit on the IM-515 is not working.<input type="checkbox"/> The DM display is not working.
Busy	If the DM display's condition is busy, it is possibly caused by the following: <ul style="list-style-type: none"><input type="checkbox"/> The DM display is running a self test.<input type="checkbox"/> After the device diagnostics utility starts, the DM display power was turned off.
Ready	The DM display is ready to receive data. A test of the DM display is possible.

COM port information

The COM ports area of the screen lists the DTR, DSR, RTS, CTS, DCD, and RI status for each of the available COM ports. When the port is disabled, you see a message to that effect.

LPT1 information

The LPT1 area of the screen lists the BSY, ACK, PE, SLCT, and ERR status for the LPT1 port. When the port is disabled, you see a message to that effect.

Messages

The message portion of the screen displays the result of tests.

Message area

Test category	Message	Description
TM printer	Disabled	The port is disabled.
	Done	The TM printer test is completed. Check the printing motion and auto cutter motion.
DM display test	Disabled	The port is disabled.
	Done	DM display test is completed. Check indication.
Drawer kick-out test	Disabled	The port is disabled.
	Done	The drawer kick-out test is completed. Check the motion of the cash drawer.
Loop-back test	Error	The diagnostics test failed. This message also appears when a loop-back connector is not connected, or the wrong loop-back connector is connected.
	Disabled	The port is disabled.
	Ok	The test completed successfully.
LPT1 print test	Time out	The printer connected to the LPT1 port did not enter a ready state after 2 seconds.
	Disabled	The port is disabled.
	Ok	The print data was sent successfully.

Using the Setup Menu

The setup menu allows you to create a password for accessing the drawer kick-out test and to set the length of time for the voltage signal supplied to the cash drawer solenoid to open it.

Defining a drawer password

Caution

You need to set a drawer password if you connect your drawer to the TM printer. If the password is not set, anyone can open the drawer using the drawer kick-out test.

Follow these steps to define a password:

1. Select the **Drawer Password** option from the setup pull-down menu. You see the following message in a dialog box:

Enter

2. Type the password you want, and press Enter. Passwords can be 4 to 8 alphanumeric characters. Make sure you enter at least four characters or numbers. You then see this message:

Re-Enter

3. Type the same password a second time, and press Enter.

The password is now defined. You see the following prompt each time you select the **Drawer kick-out test** from the device-tests pull-down menu.

Enter

Type the password and press Enter to perform the drawer kick-out test.

Changing or deleting a drawer password

Follow these steps to change or delete a password.

1. Select the **Drawer Password** option from the setup pull-down menu. You see this message:

old

2. Type your current password and press Enter. You then see the following message:

New

3. If you no longer want a password, press Enter. The password is now deleted. If you want to define a new password, type the new password and press Enter. You see this message:

Re-Enter

4. Type the same password a second time and press Enter.

Setting the Drawer ON time

The **Drawer ON time** option sets the length of time required for the voltage signal to pass through the solenoid to open the cash drawer.

To set the time, select the **Drawer ON time** option from the setup pull-down menu. You see a dialog box allowing you to enter the ON time your cash drawer requires. You can enter a value up to 500 (ms). For the appropriate value, see your cash drawer manual.

Running Device Tests

The device-tests option on the menu bar allows you to run the following tests:

- TM print test
- DM display test

- Drawer kick-out test
- COM1 loop-back test
- COM2 loop-back test
- COM3 loop-back test
- COM4 loop-back test
- LPT1 loop-back test
- LPT1 print test.



Note:

Before you perform the loop-back tests, you need to connect an appropriate loop-back connector to the port. See Appendix C for the loop-back connector configurations.

TM print test

The following tests are executed during the TM print test:

- Receipt print test, which prints a standard print pattern
- Auto cutter test (for a printer equipped with an auto cutter only)



Note:

*Before you run the test, make sure the TM status message says **online**. If it doesn't, see "TM Status Message."*

When the test is complete, make sure the standard print pattern printed. For a printer with an auto cutter, make sure the auto cutter cuts the receipt.

DM display test

The DM display test sends the following message to the DM display:

Display Module Test

******* Device Diagnostics *******



Note:

*Before you run the DM display test, make sure the DM status message says **Ready**. If it doesn't, see the table on page 3-24.*

Check the DM display screen to see if the test has been performed.

Drawer kick-out test

The drawer kick-out test opens the cash drawer. If the cash drawer opens, the test was successful. The TM printer has two drawer kick-out drive signals: signal 1 (pin 2) and signal 2 (pin 5). However, this test checks only drawer kick-out drive signal 1.

If you set a password, you see the following prompt when you select **Drawer kick-out test** from the menu bar:

Enter

Type your password and press Enter. Device diagnostics tries to open the cash drawer.



Note:

*Before you run the drawer kick-out test, make sure the TM status message says **on-line**. If it doesn't, see the table on page 3-22.*

COM ports and LPT1 loop-back tests

The following loop-back tests are available:

- The COM port test checks the DTR, DSR, CTS, RTS, TXD, and RXD signals.

- The LPT1 port test checks the STROBE, ACK, DATA0, BUSY, AUTO FEED, PAPER EMPTY, ERR, INIT, SELECT IN, and SELECT signals.



Note:

Before you run these tests, make sure the port you want to test is enabled and the appropriate loop-back connector is attached to the port.

When the tests complete successfully, you see **OK** in the message area of the screen. If the test failed, you see an error message.

LPT1 print test

The LPT1 print test prints a standard print pattern on the printer connected to LPT1. If the printer is busy, you see the time-out message in the message area of the screen.



Note:

Before you run the LPT1 print test, make sure the LPT1 port is enabled. Also make sure an appropriate printer is connected to the LPT1 port.

Initializing Device Diagnostics

When you select **Initialize** from the menu bar, device diagnostics restarts the program. If device diagnostics displays **No communication** for the TM status of TM/drawer area or DM status of DM area, fix the problem. Then select this option to reset the program. See the tables on page 3-22 and 3-24 for more information.

Leaving Device Diagnostics

When you select **Exit** from the menu bar, the system reboots.

Appendix A

Error Messages

Error Messages From Hardware Monitor

The IM-515 monitors the power supply voltages, the fan rotation, and the temperature of the CPU and inside the case. If an irregular value is detected, the system BIOS displays:

Hardware Monitor found an error, enter POWER MANAGEMENT SETUP for details

If this happens, press the Delete key to enter the BIOS setup; then find the cause of the problem. The detected items are shown in the table below.

Hardware monitors

Items	Normal range
CPU core voltage	Operating voltage ± 0.15 V
+3.3 V	3.3 ± 0.15 V
+5 V	$5.0 \pm 10\%$
+12 V	$12.0 \pm 10\%$
-12 V	$-12.0 \pm 10\%$
-5 V	$-5.0 \pm 10\%$
Rotation speed of the CPU cooling fan	70% of normal speed or more
Rotation speed of the case fan	70% of normal speed or more
CPU temperature	70° C (158° F) or less
Temperature inside the case	60° C (140° F) or less

POST Messages

During the power-on self test (POST), BIOS either sounds a beep code or displays a message when it detects a correctable error.

The following is a list of POST messages. An error message may be followed by a prompt to press F1 to continue or press DEL to enter BIOS setup.

POST messages

Messages	Descriptions
Beep	A video error has occurred, and BIOS cannot initialize the video screen to display any additional information. This beep code consists of a single long beep followed by two short beeps.
BIOS ROM checksum error — System halted	The checksum of the BIOS code in the BIOS chip is incorrect, indicating the BIOS code may have become corrupt.
CMOS battery failed	CMOS battery is no longer functional.
CMOS checksum error — Defaults loaded	Checksum of CMOS is incorrect, so the system loads the default equipment configuration. A checksum error may indicate that CMOS has become corrupt. This error may have been caused by a weak battery.
CPU at <i>nnnn</i>	Displays the running speed of the CPU.
Press ESC to skip memory test	The user may press Esc to skip the full memory test.
Floppy disk(s) fail	Cannot find or initialize the floppy drive controller or the drive. If no floppy drives are installed, be sure the Drive A selection in BIOS setup is set to None and the Onboard FDC Controller (under Integrated Peripherals) is set to Disabled.
HARD DISK initializing Please wait a moment...	Some hard drives require extra time to initialize.
HARD DISK INSTALL FAILURE	Cannot find or initialize the hard drive controller or the drive. If no hard disk drive is installed, be sure the HARD DISKS (under Standard CMOS Setup) is set to None and the On-Chip Primary IDE (under Integrated Peripherals) is set to Disabled.

POST messages

Messages	Descriptions
Hard disk(s) diagnosis fail	The system may run specific disk diagnostic routines. This message appears if one or more hard disks return an error when the diagnostics run.
Keyboard error or no keyboard present	Cannot initialize the keyboard. Make sure the keyboard is attached correctly and no keys are pressed during POST. To purposely configure the system without a keyboard, set the Halt On option in BIOS setup to All, But Keyboard . BIOS then ignores the missing keyboard during POST.
Keyboard is locked out — Unlock the key	This message usually indicates that one or more keys have been pressed during the keyboard tests. Be sure no objects are resting on the keyboard.
Memory Test:	This message displays during a full memory test, counting down the memory areas being tested.
Memory test fail	If POST detects an error during memory testing, additional information appears giving specifics about the type and location of the memory error.
Override enabled — Defaults loaded	If the system cannot boot using the current CMOS configuration, BIOS can override the current configuration with a set of BIOS defaults designed for the most stable, minimal-performance system operations.
Primary master hard disk fail	POST detects an error in the primary master IDE hard drive.
Primary slave hard disk fail	POST detects an error in the primary slave IDE hard drive.
Secondary master hard disk fail	POST detects an error in the secondary master IDE hard drive.
Secondary slave hard disk fail	POST detects an error in the secondary slave IDE hard drive.

Appendix B

Power Management

The IM-515 can enter power saving mode if the system detects inactivity. This power management feature is controlled by Advanced Power Management (APM) Ver. 1.2 and its support circuitry. The conditions for entering power saving mode depend on the settings of the APM or the settings of power management setup in BIOS setup.

IM-515 Operating Modes

The IM-515 has the following modes of operation:

IM-515 operation modes

Mode	Power saving method	Power LED
Working mode	Normal operating mode. In this mode, the system offers the fastest processing speed; however, power consumption is maximized.	On
Doze mode	<ol style="list-style-type: none">1) The system puts the cache into low power mode.2) The system controls the video using the Video Off Option in the Power Management Setup menu of BIOS setup, as listed below. Suspend -> Off: No control Susp, Stby -> Off: No control All Modes -> Off: Turns video off Always On: No control	On

IM-515 operation modes

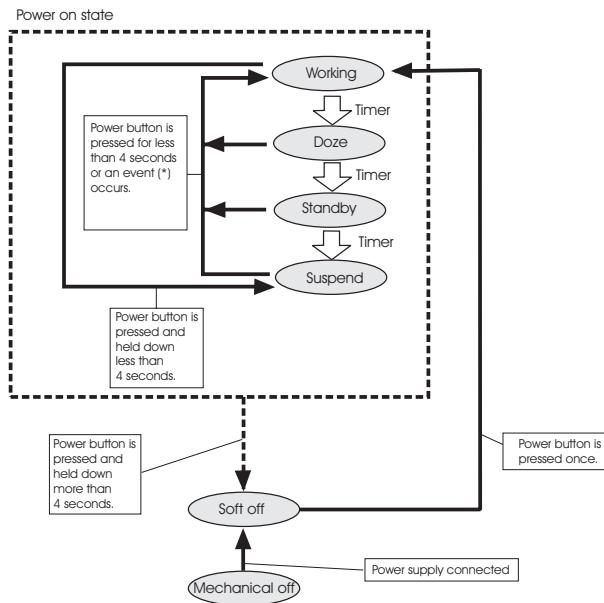
Mode	Power saving method	Power LED
Standby mode	1) The system puts the CPU into idle mode. 2) The system puts the cache into low power mode. 3) The system controls the video using the Video Off Option in the Power Management Setup menu of BIOS setup, as listed below. Suspend -> Off: No control Susp, Stby -> Off: Turns video off All Modes -> Off: Turns video off Always On: No control	Flashes twice a second.
Suspend mode	1) The system stops CPU clock. 2) The system stops unnecessary clock generators. 3) The system stops the HDD motor. 4) The system stops CPU and case fans. 5) The system controls the video using the Video Off Option in the Power Management Setup menu of BIOS setup, as listed below. Suspend -> Off: Turns video off Susp, Stby -> Off: Turns video off All Modes -> Off: Turns video off Always On: No control	Flashes once a second.
Soft Off mode	The power from the power supply stops.	Off

There are three kinds of flowcharts to show how the power management modes changes, as shown below.

- Green mode
- Disabled mode
- Power Off mode

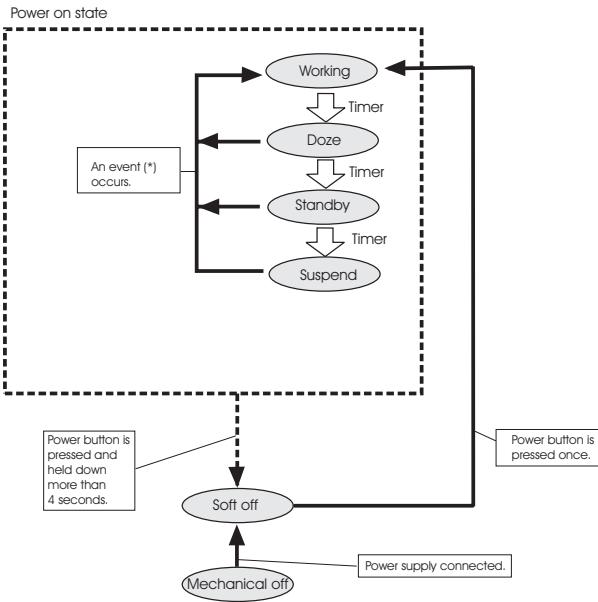
You can change the mode using the Power Button item in the Power Management Setup menu of BIOS setup.

This flowchart shows the Green mode.



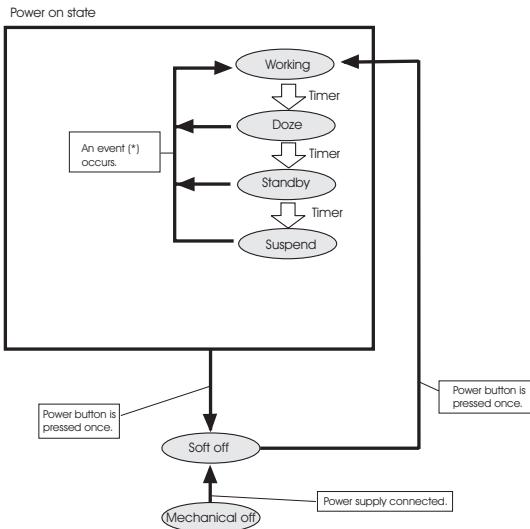
(*) An event could be an HDD access, FDD access, COM port access, LPT port access, key press, or mouse operation.

This flowchart shows the Disabled mode.



(*) An event could be an HDD access, FDD access, COM port access, LPT port access, key press, or mouse operation.

This flowchart shows Power Off mode.



(*) An event could be an HDD access, FDD access, COM port access, LPT port access, key press, or mouse operation.

HDD Motor Control

The HDD power down timer works independently of the Doze/Standby/Suspend mode timers. When the time set in the HDD power down timer has expired, the HDD motor stops.

Beep Control

The beep function is supported to signal that the system has entered suspend mode. You can change the conditions for the beep with the Beep On Suspend item in the Power Management Setup menu in BIOS setup.

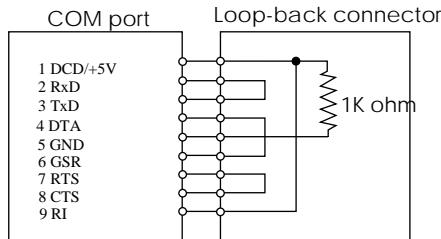
BIOS setup setting	When entering suspend mode	In suspend mode	When returning to work mode from suspend mode
Disabled	No beep	No beep	1 beep
Once	4 beeps	No beep	1 beep
1 minute interval	4 beeps	4 beeps	1 beep

Appendix C

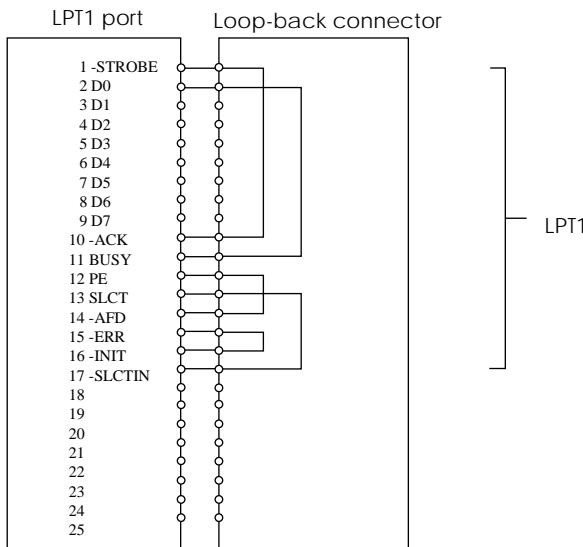
Loop Back Connectors

You need to connect a loop-back connector to the serial ports or the LPT1 port to test these ports using device diagnostics.

The first illustration below shows the loop-back configuration used to test the serial port. The second illustration shows the configuration used to test the LPT1 port.



Loop-back connector for serial ports



Loop-back connector for the LPT1 port

Appendix D

Specifications

CPU and its Support Logic

Items	Descriptions
CPU socket	Socket 7 The following CPUs are supported: Intel Pentium P54C (75 MHz to 200 MHz) Intel MMX Pentium P55C (166 MHz to 233 MHz) AMD K6-PR166 (166 MHz) to K6-PR200 (200 MHz)
Onboard memory	None
Secondary cache memory	512KB (pipelined burst)
SIMM socket	72-pin, 32-bit x 2 sockets
System ROM	256KB flash ROM
NVRAM for POS	SRAM 32KB (backed up by a Vanadium-Lithium battery)
Chip set	ALI Aladdin IV+ (M1531B/M1543)
RTC	MC146818A compatible (backed up by a Vanadium-Lithium battery)
Keyboard controller	80C42 or equivalent
I/O controller	ALI M5113 (for COM3 and COM4)

Interfaces

Items	Descriptions
FDD	34-pin connector
EIDE	One IDE channel (Ultra DMA supported)
Serial	9-pin D-sub male x 4 ports (16550-compatible UART)
Parallel	25-pin D-sub female x 1 port (ECP/EPP supported)
Keyboard	6-pin mini DIN female x 1 port (PS/2 type)
USB	Series A connector x 2 ports (supported by Aladdin IV+, which is an OHCI-compatible controller.)

Video

Items	Descriptions
On-board video	None. Needs a commercially available video board in the PCI or ISA slot.

Expansion Slots

Items	Descriptions
PCI slot	32-bit, half-size x 3 slots Length 240 mm (9.4") (or 130 mm (5.1"): see page 2-14 for details), width 107 mm, (4.2"), height 12 mm (0.5") (parts side) 10 mm (0.4") (solder side) Card-edge connector
ISA slot	16-bit, half-size x 1 slot Length 240 mm (9.4"), width 107 mm (4.2"), height 12 mm (0.5") (parts side) 10 mm (0.4") (solder side) ISA AT-compatible, 7.2 MHz bus speed, with a card-edge connector
Exclusive slot	Half-pitch card edge connector x 1 For a PCMCIA expansion module supporting two Type I or II PC cards or one Type III PC card
Front exclusive slot	Half-pitch card edge connector x 1 For a front PCMCIA expansion module supporting two Type I or II PC cards or one Type III PC card

Hard Disk Drive

A hard disk drive with the following specifications can be used.

Items	Descriptions
Type	2.5 inch
Thickness	19 mm (0.75") maximum
Interface	IDE/EIDE (up to PIO mode 4 or UDMA mode 2)
Connection	Connected by an exclusive bracket

Floppy Disk Drive

An FDD with the following specifications can be used.

Items	Descriptions
Type	3.5 inch
Thickness	1 inch
Capacity	1.44MB / 720MB

SIMM

The system allows installation of a single SIMM. However, it is recommended that you use SIMMs in pairs, both of the same type and capacity.

SIMMs with the following specifications can be used.

Items	Descriptions
Type	72-pin SIMMs, Fast page mode or EDO mode
Access time	70ns or less (60ns or less is recommended.)
Parity	None or ECC support
Capacity	4MB/8MB/16MB/32MB/64MB

ECC Support

ECC can be supported in the following conditions:

- Use a pair of parity SIMMs.
- Use the BIOS setup and set the Memory Parity/ECC check to “Enabled” in the BIOS Features Setup menu.

Make sure the SIMMs are the same type and capacity.

Battery

Items	Descriptions
Number of batteries	1
Type	Vanadium-Lithium battery
Backup devices	RTC, CMOS RAM, and NVRAM for POS
Charging method	Constant-voltage charge 4.3 V ± 0.15 V
Charging time	40 hours maximum
Backup time	30 days minimum (from full charge)

Indicators

Items	Descriptions
Power LED (Green)	The Power LED indicates power on/off and the power management mode. Lit: Power is on (working mode or doze mode). Flashing in 2 Hz: standby mode Flashing in 1 Hz: suspend mode Off: Power is off (soft off mode) See Appendix B for information about power management.
HDD LED (Green)	The HDD LED indicates accessing of the hard disk drive (when a hard disk drive is installed).
FDD LED	The FDD LED indicates accessing of the floppy disk drive (when a floppy disk drive is installed). The FDD LED is attached to the floppy disk drive.

Power Supply

Items	Descriptions
AC input (ratings)	90 (100 – 10%) VAC to 264 (230 + 15%) VAC 50/60 Hz \pm 3 Hz 180 VA or less (except for AC output)
DC output (ratings)	3-pin plug: +24 VDC \pm 3%, 2.0 A, 48 W Peak: 4.5 A (300 msec, duty 1/10) 16-pin plug: +5 VDC \pm 5%, 9.0 A, 45 W +12 VDC \pm 5%, 2.0 A, 24 W -5 VDC \pm 10%, 0.5 A, 1.5 W -12 VDC \pm 10%, 1.0 A, 12 W
AC output (ratings)	90 (100 –10%) VAC to 264 (230 +15%) VAC 50/60 Hz \pm 3 Hz 200 VA or less This output is intended for a monitor.

Standards for the IM-515

The following standards are applied only to the printers that are so labeled. (EMC is tested using the exclusive power supply)

For North America	EMI: Safety standards:	FCC Class A UL 1950-2th-D3 c-UL
For Europe	EMC: Safety standards:	CE marking EN55022 EN50082-1 TUV IEC 950 (EN60950)
For Japan	EMI:	VCCI Class A
For Oceania	EMC:	AS/NZS 3548 (CISPR) class B

Power Limits of the IM-515

Total current consumption must not exceed the capacity shown below for each voltage, +5 V, -5 V, +12 V and -12 V.

Voltage line	Applicable slots and ports	Capacity
+5 VDC	PCI slots ISA slot Exclusive expansion slots USB ports COM1 to COM4 ports	5.0 A (*)
-5 VDC	PCI slots ISA slot Exclusive expansion slots	0.5 A
+12 VDC	PCI slots ISA slot Exclusive expansion slots COM1 to COM4 ports	2.0 A
-12 VDC	PCI slots ISA slot Exclusive expansion slots	1.0 A

(*) This value is based on the Intel MMX Pentium 200 MHz processor. If you use a CPU that consumes more current than the Intel MMX Pentium 200 MHz processor, this value could be lower. The total value, including CPU, is 9 A.

Dimensions

IM-515 dimensions

	Size (W x D x H)		
	Width	Depth	Height
IM-515 (*)	246 mm (9.7")	302 mm (11.9")	116 mm (4.6")

(*) Excluding projections.

Power supply dimensions

	Size		
Power supply (*)	138 mm (5.4") width	261 mm (10.3") depth	65 mm (2.6") height
Cable for IM-515	1.3 m (51.2") length		
Cable for TM printer	1.5 m (59.1") length		

(*) Excluding projections

Environmental Requirements

Condition	Operating range	Storage range
Temperature	5° to 35° C (41° to 95° F)	-10° to 50° C (14° to 122° F)
Humidity (RH)	30% to 80% (non-condensing)	30% to 90% (non-condensing)

DMA Assignments

Controller	Channel	Application
DMA1 8-bit	0	Spare (*)
	1	Spare (*)
	2	Floppy disk drive controller
	3	Spare (*)
DMA2 16-bit	4	Controller 1 cascade
	5	Spare
	6	Spare
	7	Spare

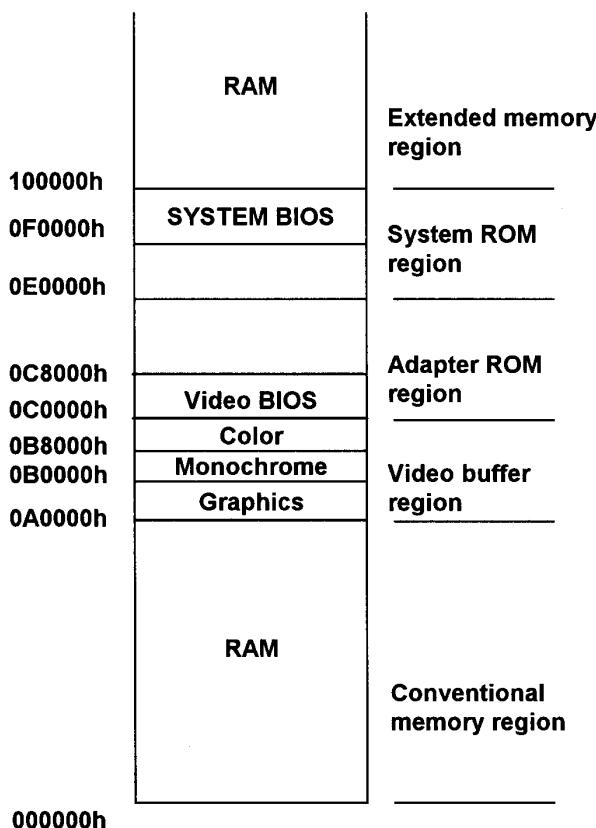
(*) Any one of these channels may be used when LPT1 is set to ECP mode.

Hardware Interrupts

Some system interrupts can be changed using BIOS setup or the Plug & Play feature.

Controller 1	Controller 2	Application	Changable
IRQ0		Timer	No
IRQ1		Keyboard	No
IRQ2		Controller 2 cascade	No
	IRQ8	Real-time clock	No
	IRQ9	Software redirect	No
	IRQ10	Serial port (COM4)	Yes
	IRQ11	Serial port (COM3)	Yes
	IRQ12	Mouse (if PS/2 mouse is used)	No
	IRQ13	Math coprocessor	No
	IRQ14	Primary hard disk controller	No
	IRQ15	Secondary hard disk controller	Yes
IRQ3		Serial port (COM2)	Yes
IRQ4		Serial port (COM1)	Yes
IRQ5		Not used	N/A
IRQ6		Floppy disk drive controller	No
IRQ7		LPT1	Yes
NMI		I/O error check	No

System Memory Map

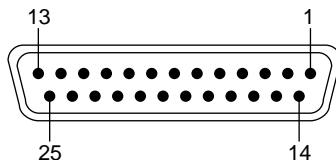


System I/O Map

Some I/O addresses can be changed using BIOS setup or the Plug & Play feature.

I/O address	Contents	Changeable
00h to 1Fh	DMA controller 1 (8237A)	No
20h to 3Fh	Interrupt controller 1 (8259A)	No
40h to 5Fh	Timer/counter (8254)	No
60h to 6Fh	Keyboard controller (8042)	No
70h to 7Fh	Real-time clock, NMI mask	No
80h to 9Fh	DMA page register	No
A0h to BFh	Interrupt controller 2 (8259A)	No
C0h to DFh	DMA controller 2 (8237A)	No
F0h	Coprocessor error release register	No
1F0h to 1FFh	Hard disk drive controller	No
290h to 297h	LM78 access port	Yes
2E8h to 2EFh	Serial port 4	Yes
2F8h to 2FFh	Serial port 2	Yes
378h to 37Fh	Parallel port 1 (When ECP mode is used, I/O addresses +400h are used also.)	Yes
398h	M5113 I/O configuration register	No
3C0h to 3DFh	VGA register	No
3E8h to 3EFh	Serial port 3	Yes
3F0h to 3F1h	M1543 I/O configuration register	No
3F0h to 3F7h	Floppy disk drive controller	No
3F8h to 3FFh	Serial port 1	Yes
40Bh	DMA1 expansion mode register	No
480h to 48Fh	DMA high page register	No
4D0h	INT_1 (master) edge/level control	No
4D1h	INT_2 (slave) edge/level control	No
4D6h	DMA1 expansion mode register	No
CF8h to CFFh	PCI control register	No
4000h to 407Fh	Power management I/O register	No
5000h to 50FFh	SM bus controller	No
62D0h to 62D8h	IM-515 customized gate array control	No

Connector Pin Assignments



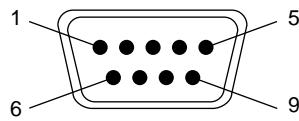
Parallel port (LPT1) connector pin assignments

Pin	I/O	Signal
1	O	STROBE
2	I/O	DATA BIT0
3	I/O	DATA BIT1
4	I/O	DATA BIT2
5	I/O	DATA BIT3
6	I/O	DATA BIT4
7	I/O	DATA BIT5
8	I/O	DATA BIT6
9	I/O	DATA BIT7
10	I	ACK
11	I	BUSY
12	I	PE
13	I	SLCT
14	O	AUTO FD XT
15	I	ERROR
16	O	INIT
17	O	SLCT IN
18	—	GND
19	—	GND
20	—	GND
21	—	GND

Parallel port (LPT1) connector pin assignments

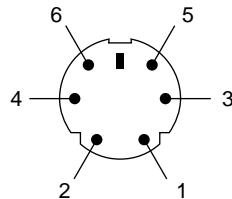
Pin	I/O	Signal
22	—	GND
23	—	GND
24	—	GND
25	—	GND

A line above a signal indicates active LOW logic



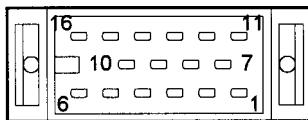
Serial port (COM1 to COM4) connector pin assignments

Pin	I/O	Signal
1	I/—	DCD/+5 V/+12 V
2	I	RxD
3	O	TxD
4	O	DTR
5	—	GND
6	I	DSR
7	O	RTS
8	I	CTS
9	I	RI



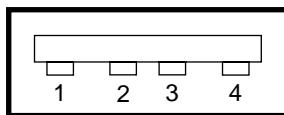
Keyboard/PS2 mouse connector pin assignments

Pin	I/O	Signal
1	I/O	KBDATA
2	I/O	MSDATA
3	—	GND
4	—	+5 V
5	I/O	KBCLK
6	I/O	MSCLK



Power supply connector pin assignments

Pin	I/O	Signal
1	—	+5 V
2	—	+5 V
3	—	+5 V
4	—	-5 V
5	—	GND
6	—	GND
7	—	GND
8	—	GND
9	—	-12 V
10	—	+12 V
11	—	+5 V
12	I	PWRGOOD
13	—	Reserved
14	I	PSWI
15	—	Remote-sense
16	—	FG



USB connector pin assignments

Pin	I/O	Signal
1	—	+5 V
2	I/O	USB+
3	I/O	USB-
4	—	GND

Appendix E

EPSON Sales Subsidiaries

EPSON AMERICA INC./OEM DIV.	20770 Madrona Ave. Torrance, CA 90559-2842 U.S.A. Tel : 1-310-787-6300 Fax : 1-310-782-5350
EPSON EUROPE B.V.	Prof. J.H. Bavincklaan 5 1183 AT Amstelveen The Netherlands Tel : 31-(0)20-5475-251 Fax : 31-(0)20-6454-315
EPSON Deutschland GmbH	Zülpicher Strasse 6, 40549 Düsseldorf 11, Germany Tel : 49-(0)211-5603152 Fax : 49-(0)211-5603319
EPSON U.K. LIMITED	Campus 100 Maylands Ave. Hemel Hempstead Herts. HP2 7TJ United Kingdom Tel : 44-1(0)442-61144 Fax : 44-1-(0)442-227-244
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EPSON AUSTRALIA PTY. LTD.	70 Gibbes Street, Chatswood NSW 2067 Australia Tel : 61-(0)2-415-9000 Fax : 61-(0)2-417-0077
EPSON HANBAI CO., LTD. TOKYO OFFICE:	3F Building Kawaguchi Fuda Chofu-Shi Tokyo 182 Japan Tel : 0424-99-7829 Fax : 0424-99-7834
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